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**WARTIME
PUBLIC
PROTECTION
IN THE 1980'S**

Final Report of the
Task Force on War Planning
and Concepts of Operations
1985

Government
Publications

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Not for Publication

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WARTIME PUBLIC PROTECTION IN THE 1980'S

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April 3, 1985

Mr. W. B. Snarr,
Executive Director,
Emergency Planning Canada,
Ottawa, Ontario

Dear Mr. Snarr,

I have the honor to present to you the Final Report of the Task Force on War Planning and Concepts of Operations.

The work of the Task Force is in two parts. There are the working papers that the Task Force developed to examine matters in detail and there is the main report, entitled Wartime Public Protection in the 1980's, that contains the conclusions and recommendations of the Task Force resulting from our work. We are greatly indebted to many who helped us; other federal and provincial public servants, members of the Canadian Forces and academics to name but a few.

It is worth noting that the Royal Society of Canada report on the Environmental Consequences of Nuclear War was released as our work was nearing completion. We share with them the fact that the issues are contentious and consensus difficult.

We commend to those who may have reservations about our conclusions, two recommendations from the report of the Royal Society.

"Canada should reexamine its preparedness for post nuclear attack conditions. Emergency Planning Canada (EPC) is well aware of the controversy, but there is a need for all public agencies to familiarize themselves with the threat, and to consider the special implications of nuclear winter. Such an examination should be centrally coordinated."

and

"Canada should resist the argument that such preparations admit the inevitability of nuclear war, or that they weaken the case for disarmament. There is a present obligation to provide as well as possible for survivors of such a war, in the face of a bitter nuclear winter."

Sincerely,

F. D. Cooper
Chairman

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SECTION 1

INTRODUCTION

The Task Force on War Planning and Concepts of Operations was established in Winnipeg in February, 1983, during a meeting of federal and provincial emergency planning officials.¹ Ten officials, five each from the provincial and federal governments, were asked to conduct an in-depth review of wartime public protection in Canada, in keeping with the terms of reference attached as Annex 1 to this report.

From February, 1983, to March, 1985, the Task Force met in plenary session five times. Six working groups were also formed to permit a closer examination of specific topics, like public information and radiological defence in a wartime setting.

This report follows the plan of work implicit in our terms of reference. In section 2, we present an overview of the field of wartime public protection, identifying and describing the key components of passive or civil defence in Canada as formulated in the 1950s and 1960s. In section 3, we provide our assessment of concepts of operations that date from that period, and we take a closer look at the key components of the field. In section 4, we treat the contentious issue of longer-term survival and recovery, and we make several recommendations for a modest governmental program to raise our present level of preparedness in this regard. In section 5 we provide a summary of conclusions and recommendations.

The Basic Question

By addressing the possibility of survival following nuclear war, the Task Force has been inescapably drawn into one of the most highly-charged debates now raging in the developed societies. It seems incumbent upon us, accordingly, to state our orientation to this basic question at the very outset of our report.

¹ The Task Force considers the Territories as provinces for the purposes of this report.

Should it occur, nuclear war would cause devastation on a scale that would plunge mankind into a more immediate and profound crisis than ever before experienced. The wartime use of nuclear weapons in proportion to their availability would everywhere imperil human life and place the objective of recovery decades, if not a century, from realization. No thinking person wants nuclear war.

Under current and foreseeable conditions, any conceivable nuclear war would leave some Canadian survivors. These survivors could, at least initially, number in the millions, and it is the purpose of this study to make recommendations which, if implemented, would increase and sustain this number, bearing in mind that the human and financial resources available to this end are, and will remain, very limited.

Nor are resource limitations the sole confounding factor. Equally informed individuals of good will can come to radically different conclusions about the subject of public protection against nuclear weapons. So many are the opportunities for error and so crucial are the questions yet unanswered, that we wish here to mention some of the barriers to knowledge that have proved to be lasting sources of uncertainty to all work in this field, past, our own, and future.

Source of Uncertainty

In seeking to discharge the mandate conferred upon it, the Task Force was confronted by questions that often limited its ability to speak with complete certainty in this report. For example, the long-term environmental effects of nuclear war -- particularly the possibility that multiple and roughly coterminous nuclear detonations would irreparably harm global agriculture -- are a matter on which achieving consensus within the scientific community has been difficult.

A great deal of the difficulty stems from the fortunate fact that there has not been a nuclear war, notwithstanding the use of two nuclear weapons in the latter stages of World War II. Such analyses as have been attempted over the years on the conduct and effects of contemporary thermonuclear war have posited diverse and conflicting scenarios, attack patterns, and impacts. In section 3, the Task Force recommends that the govern-

ment of Canada sponsor a program of scholarly research into nuclear war and associated subjects. There is still no generally accepted model of what form a nuclear war would take, and no consensus exists on the specifically Canadian implications of such a war. The probable extent of devastation in Canada from nuclear weapons is unknown and is likely to remain unknown for the foreseeable future.

We have, accordingly, worked forward from certain observations that seem to us of pivotal importance in estimating Canada's unique plight.

Unlike the situation in the United States of America, in many of the nations of Western Europe, and in Warsaw Pact countries, where the presence of strategic and Euro-strategic missiles practically assures direct attack in wartime, Canada has no military facilities in these categories. At the same time, virtually all the developed societies, including Canada, do have military installations, airports, ports, harbours, industrial complexes, and administrative centres which in wartime could represent second- or third-order priorities for attack by nuclear weapons.

Given the size of the nuclear arsenals of the potential adversaries, it would not be difficult for them to devote sufficient numbers of weapons to inflicting very great direct damage in all parts of Canada and to put in grave doubt the prospects for longer-term recovery worthy of the name. It is not primarily a matter of military capabilities that is at issue here; it is a matter of strategic intentions. Canada is most unlikely, however, to know before an actual attack what priorities have been attached to which potential Canadian targets.

It follows that any attempt to provide protection from blast, heat, initial radiation, and light -- the primary effects of nuclear weapons -- would have to be predicated on not much more than guesswork about the location of endangered areas.

The prospects for any Canadian city that suffers direct attack are clear. The city itself would not survive, although the poignant example of the survivors of Hiroshima and Nagasaki suggests that some individuals near ground zero will do so. There may be some found alive in the collapsed rubble of buildings at the outer edge of the lethal radius of ground zero, but these will be few. There may be the odd individual who lives despite massive doses of radiation, but virtually all of whom this may be said will be in the process of dying from acute radiation sickness. Despite every precaution, there will be many blinded from the intense light generated by the weapon, many who are badly burned, and many seriously injured by objects sent flying by the blast. For most of these people, purely palliative care may represent the best response, and the only response possible, until death releases them from their misery.

Further away from ground zero, injured survivors will be encountered who, given skilled and timely medical attention, might recover from their injuries. Some effort will be needed to distinguish these from others nearby who are fatally wounded. The medical technique of on-the-scene triage seeks to maximize the return on limited medical resources by making such determinations, but nobody would find it easy to go by the book in these circumstances.

If we Canadians have been relatively fortunate, the searing agony of a direct attack will be restricted to a few areas or perhaps not visited on our country at all. If we are less fortunate, we shall have to cope with impossible demands as best we can. In either case, each of us has to continue to live with the greatest uncertainty of all.

There is no point in wishing away what most Canadians regard as the real meaning of nuclear war and the reason they believe that it cannot be survived. There is simply no defence against direct damage, nor would this report have much credibility if it understated the misery direct attack would cause. The hard truth is that no amount of paper planning will prepare Canada to deal effectively with the reality of areas attacked directly.

The indirect effects of nuclear weapons, chiefly radioactive fallout, also threaten Canadian lives. The initial radiation produced by a ground-burst nuclear detonation is very short-lived and its damaging effects limited to an area approximately that of the lethal radius of the blast. The immediate fatalities that occur at close range can be attributed to the shock and thermal effects of the weapons, notwithstanding the added presence of very high levels of radiation. Further away from ground zero, however, the dirt, sand, and dust produced by the explosion -- when drawn up into the fireball and charged by its radiation -- settle gradually to earth as "early fallout" to contaminate a much larger area than that of direct damage.

Radioactive fallout can kill hundreds of miles from ground zero. Indeed, it is arguable that more Canadians would be put in peril by fallout than by blast or the other direct effects of nuclear weapons. This danger is most pronounced where high-priority military targets have been situated in parts of the United States not far from the international border with Canada. Higher-level winds could carry radiation well into the Canadian heartland, endangering everyone in its path. For the areas immediately north of strategic missile bases, the threat from early fallout is particularly acute. But most parts of the country, even if not attacked directly, could be subjected to radioactive fallout produced by detonations near Canadian and American secondary or tertiary targets.

The final and exact distribution of local and residual fallout produced by nuclear attack on North America depends both upon the location of detonations and upon the strength and direction of winds in these areas. We can speak with confidence about some targets, not all, and winds are neither unidirectional nor predictable much in advance. As with direct damage within Canada, the forecasting of indirect damage is an uncertain endeavour that inescapably entails guesswork and estimation.

Another source of uncertainty is that the field of public protection against nuclear war falls into a constitutional grey area. Public protection is not a field that can be consigned neatly to Ottawa or to the provincial capitals. Rather it requires building and sustaining a partnership among federal, provincial, and municipal governments, not to mention industry, voluntary organizations, and individuals. From government must come leadership and appropriate public resources. Without these there will be no program of public protection in Canada for the years and decades to come.

Is "Civil Defence" Possible?

In some quarters, civil defence programs are characterized as a cruel hoax put forward to persuade the public that nuclear war is survivable and even "winnable". Others, active in this public debate, have pointed out that the damage and agony that would be caused by a direct attack on any one of our major cities would far exceed our national ability to provide medical care for the wounded. Multiply that calamity by a factor of ten or twenty, they contend, and sheer survival would become problematical, while the notion that there can be such a thing as effective civil defence is shown to be simply ludicrous.

If, by "civil defence" one means a set of arrangements or a program that could guarantee the survival of those caught at or near ground zero, then the Task Force itself would deny the realism of such a conception of civil defence.

If, on the other hand, "civil defence" means an organized effort to limit death and injury and to marshal available resources in an attempt to soften the destruction nuclear war would cause, there can indeed be civil defence for the 1980s and beyond.

This vital distinction between these two conceptions of what a contemporary civil defence program can deliver is too often overlooked. Indeed, some proponents of civil defence have contributed to the confusion by exaggerating the benefits of public protection programs, while minimizing the dislocation that conflict involving nuclear weapons would produce. The plain fact is that no Canadian city could, in any meaningful way, survive an unexpected direct attack by even a moderately-powerful nuclear weapon. The Task Force really has only minor technical reservations about those now-familiar public presentations that begin with the hypothetical detonation of a nuclear weapon on or over a well-known local landmark and proceed from there to catalogue the kinds of damage that would most assuredly ensue.

Equally, however, it is mistakenly argued by opponents of civil defence programs that literally nothing can be done to save lives once nuclear war erupts, and that any survivors would inevitably freeze or starve to death in the months shortly thereafter. The measures described in this report would ensure the survival of many thousands of Canadians who otherwise would perish in the event of nuclear war. Of course, no program of wartime public protection can substitute for spirited efforts to ensure that a nuclear war is never fought. We would never wish to appear to argue otherwise. Nor, for that matter, would the implementation of the specific measures advocated here make nuclear war a more thinkable proposition or more likely to occur.

The Purpose of the Report

The purpose of this report is to identify the means to increase the number of Canadians who would survive nuclear war and materially to improve their chances of reconstituting one day some semblance of civil society. This is the most that could fairly be expected of civil defence in the nuclear age.

To some, the achievement of these modest objectives will not be worth pursuing at any price. To be sure, the post attack environment facing survivors will be cold and barren, deeply inhospitable to civilized life and to our most cherished values.

For an indeterminate period, survivors would be drawn into a grim contest to replenish the essentials of life at a rate faster than these are consumed.

Yet there are several ways that we can help them to endure and, one day, perhaps to restore a measure of civility to their collective life. There is, after all, no mystery about elemental human needs, and it should not be beyond our wit or our willingness to place some appropriate resources in trust for this future use.

SECTION 2

WARTIME PUBLIC PROTECTION: AN OVERVIEW

This section presents a preliminary analysis of the components of wartime public protection in Canada. It identifies and describes briefly the seven elements that, taken together, would form the heart of a program in civil defence for Canada for the 1980s and beyond.

These program elements are:

- Shelter Planning
- Radiological Defence
- Warning and Survival Readiness
- Public Information
- Essential Services
- Remedial Evacuation
- Reception

Shelter Planning

The feasibility of a network of shelters affording protection against the devastating effects of nuclear weapons has long been, and is still, in the popular view, the heart of the question of civil defence. There remain only three ways that a threatened population can organize and perform this function: advance creation of special facilities designed to withstand both primary and secondary effects of nuclear weapons (or "blast shelters"); construction or identification and modification of structures to afford protection from radioactive fallout (or "fallout shelters"); or, foregoing advance planning, reliance on an ability to construct rapidly, from readily available materials, temporary structures giving a measure of relief from blast and/or fallout ("expedient shelters").

Blast Shelters

To be effective, blast shelters must prove capable of withstanding very sharp increases in atmospheric overpressures (blast), light, heat, and initial radiation which are the direct effects of nuclear weapons. Thereafter, they must, as well, provide protection from various intense forms of radiation that, fortunately, dissipate over time.

Obviously, the nearer to ground zero a blast shelter is located, the stronger it must be to satisfy its purpose. How strong is strong enough depends, as well, on the size of the nuclear weapon in question. As a general rule, the greater the strength necessary, the more difficult it is to modify existing homes and buildings to serve adequately as blast shelters. The best blast shelters, in other words, are specially created and have no other purpose.

Conversely, as distance from ground zero increases and/or if a smaller nuclear weapon is posited, the degree of blast protection inherent in such structures as subways, underground malls, or basement fallout shelters rises correspondingly.

As a protection option, the creation of a network of blast shelters for the public makes most sense only in areas known to be targets for attack. In such areas, the problem is how to situate them away from ground zero,- where no shelter we could afford to build in any number would help much-, but near enough to the target area to be accessible quickly. Beyond this circular band, which may range anywhere from one mile to ten in radius from ground zero, blast shelters become essentially little more than very expensive fallout shelters. This is true because blast overpressures decrease geometrically with distance, a rule which holds for every size of nuclear weapon.

Canada does not have strategic missile bases that would clearly represent high-priority targets for attack by nuclear weapons. There are, therefore, no conspicuous locations where blast shelters are now known to be necessary to save endangered Canadian lives. We would simply be guessing where to erect them.

This is not to argue that any military installation or airport or city in Canada is in any way exempt from nuclear devastation, for none is. It is entirely possible in any event that unintended destruction could occur virtually anywhere in Canada owing to our geo-strategic location, to technical failure, or to chance.

Many estimated attack patterns, including some that identify probable targets on Canadian territory, were reviewed. At this time there is no accepted model on

the threat to Canada from nuclear war. Future governmental study may confirm that there are areas of our country in special danger from the direct effects of nuclear weapons. In such areas, whenever they are identified, recourse to blast shelters, to organized evacuation, or to strengthened fallout shelters would be completely consistent with the spirit of this report.

The question is whether a massive program to construct blast shelters, assuming agreement on appropriate locations, would represent a cost-effective means to save Canadian lives. The Task Force concludes that there are better ways to spend the limited resources currently available for public protection.

Fallout Shelters

In the event of nuclear war, the Task Force believes that residents of every province could be subjected to radioactive fallout of intensities sufficient to pose grave hazards to life. Technically adequate and livable fallout shelters would serve admirably to combat this danger and to minimize what we would regard as needless Canadian deaths.

The effectiveness of any fallout shelter may be assessed by reference to two factors. First, it must prove capable of withstanding the peak radiation levels that occur soon after a nuclear detonation. By means of a barrier through which harmful radiation cannot easily pass, a fallout shelter provides a kind of insulation for those inside. This barrier could be formed by lead, steel, concrete, water, soil, or brick or any other difficult-to-penetrate material. A shelter formed by three feet of packed earth, for example, will stop approximately 98% of the dangerous gamma rays seeking to penetrate it.

Whether the protection level provided by a given barrier is sufficient to ensure survival depends upon the amount and intensity of radiation in the immediate environment. Areas near and downwind of ground-burst explosions will require quite substantial protection factors, but even the lightly-modified basement of a wood-frame house could serve well enough in zones downwind but far from ground zero. In the preceding example, the remaining 2% of gamma radiation could pose

a serious health hazard in exceptionally radioactive areas.

The second requirement a fallout shelter must satisfy is livability. Of this there is no better measure than the amount of time people find it possible to tolerate shelter life.

Time is a key variable, because most forms of radiation dissipate fairly quickly. For example, within two weeks, peak radiation levels will gradually decline to less than one per cent of the highest value. The more time spent inside shelters, the less likely we would be to suffer harmful exposure following attack.

Yet, any number of good reasons may force shelter residents to return too quickly to a contaminated environment. Lack of food or water could do so, or insufficient ventilation, or the sheer build-up of stress might drive protected individuals to seek relief outside, thereby exposing themselves to dangerously high

levels of radiation. In the absence of authoritative guidance on ambient radiation, even those comfortably sheltered could unknowingly leave their shelters too soon. To an extent, these problems can be met by effective monitoring and by rotating extra-shelter missions, the latter to ensure that no single individual is exposed disproportionately to radioactive fallout.

Adequate fallout shelters can be specially constructed, though very few have been, or they can be developed using the raw materials around us. The degree of protection already present in high-rise buildings, farm cellars and city basements, malls, and office buildings is not insignificant, and simple modifications to this base could materially improve this standard. A clear advantage of pursuing this avenue is cost: it is here that expenditures yield the greatest return in terms of lives saved.

It should be possible, as a matter of basic public policy, to guarantee the availability of adequate fallout protection to every Canadian. This is the necessary minimum in wartime public protection that Canadians need and deserve for the years and decades to come. In section 3, the Task Force will recommend a

mixed, four-part strategy to secure this necessary minimum.

Expedient Shelter

Several recent books contain detailed instructions for making expedient shelters, most notably Cresson H. Kearny's Nuclear War Survival Skills (Oak Ridge, Tennessee, Oak Ridge National Laboratory, 1979). The general proposition is straightforward: quite substantial levels of protection from blast and/or fallout can quickly be achieved by employing simple construction techniques on commonly-available materials. Expedient shelters, it is sometimes argued, may in any case prove superior to those discussed above because they do not presuppose complicated government planning or extensive private investment. An individual, family, or small group can quietly take the initiative to try to survive nuclear war, and succeed.

The Task Force is generally supportive of this approach, and would commend it to the attention of all Canadians who regard nuclear war as a near-term likelihood. At the very least it will be a matter of several years before the range of measures proposed in this report could be implemented. Just as there can be no guarantee that civil defence measures will ever be needed, there can be no guarantee that they will not be needed before they are ready. Expedient shelters -- a car-based shelter, for example, or a backyard trench -- could well turn out to be a very wise investment.

Detailed Arrangements

Whatever approach to shelter planning is settled on, it should be emphasized that successful implementation requires attention to a number of questions of detail. We refer to arrangements for marking and otherwise identifying shelters to the public; allocating public access to optimal levels; organizing and securing sufficient food and water; putting in place means of ventilating, heating or cooling; and attending to the sanitation and hygiene needs of shelter residents. These matters are fundamental to shelter livability, and arise equally in public or private shelters, whether improvised or designed for blast or for fallout. An approach to

developing the capabilities needed is found in section 3.

Crisis Relocation

In conjunction with our review of shelters, the Task Force considered the possible recourse to mass evacuation as a means of saving lives among the residents of Canada's largest cities in the event of nuclear war. Crisis relocation on the American model is not well suited for Canadian conditions, for several reasons.

First, as already discussed, it is very far from certain that any major urban centre in Canada will be attacked directly by nuclear weapons.

Second, the logistics of an organized evacuation of a city the size or location of Toronto, Montreal or Vancouver pose formidable problems. We speak here not only of the one-time movement of large numbers of individuals and families away from their homes but also of the problems of reception areas: how to provide shelter, food, and basic social, medical, and perhaps employment services to those relocated. To be effective, crisis relocation would require a capability to support and shelter very large numbers of people for a period of a month or more, and to forego the goods and services the evacuees would have produced. The development of such a capability would prove exceptionally costly, even assuming that it would be exercised only under ideal seasonal, climatic, and economic conditions.

Third, it is entirely possible that evacuees would inadvertently be moved from areas where the amount of radioactive fallout may be low to areas much less safe. Moreover, it is most unlikely that the fallout shelters available in reception areas would match those available in any large city. A relocated population could well be placed in greater risk from fallout than one which remains in any given urban centre.

Fourth, the time required to implement crisis relocation plans for a great city would at a minimum be two or more days. Such a period is plainly longer than the period of tactical warning we are likely to have

before imminent attack. In Canada and elsewhere, decisions to evacuate cities would have to be made, instead, on official impressions or readings of the crisis which could, whether accurate or not, widen and deepen it.

There are better ways to allocate the limited resources available for programs of public protection in Canada.

At the same time, one cannot be insensitive to those who believe, for whatever reason, that they live in areas likely to be subject to direct attack. To them it is apparent that they must relocate to survive, and they are likely to do so at some point in any confrontation grave enough to evoke thoughts of war. As one part of a limited governmental program to assist dispersal, Canadians so desiring should be provided with reliable guidance sufficiently detailed to enable them to improvise effective shelter and to maintain a measure of self-sufficiency wherever they choose to relocate. Such information should assist all those who intend to relocate to sequester in advance or to carry with them what they will need to sustain themselves for a lengthy period during which other assistance may not be available.

One further point should be stressed in this discussion of mass evacuation. Which, if any, Canadian cities will suffer direct attack during nuclear war is unknown, and indeed is probably unknowable, before an attack has actually commenced. While the Task Force is critical of evacuation planning that categorically assumes that any given urban centre in Canada will be designated as a target and destroyed, it also concludes that it would also be an error to create plans that confidently assume any given urban centre will be spared direct attack. This holds particularly for Ottawa and for several provincial capitals. Any emergency plans and arrangements that presuppose continuity of government in their usual locations seem unrealistic.

Radiological Defence

The existence of a network of adequate fallout shelters would considerably reduce the number of Canadian fatalities from nuclear war. People not effectively protected from radioactive fallout where it

is present will, on average, be subjected to perhaps forty or fifty times the amount of radiation than those nearby but well sheltered will receive. The key term in this statement is "where it is present", because radioactive fallout is unlikely to blanket Canadian territory at all evenly. It is a matter of the very highest importance to have in place a dependable means of determining where fallout is present and where it is not. The name given some years ago to this activity is "radiological defence".

Radiological defence can deceptively appear to be a relatively simple and straightforward matter: to detect and report on the presence and intensity of the radioactive sand or dust we call fallout. All that is required is appropriate instrumentation and some form of organization to receive, distill, and pass along reports from and to the local area.

With sufficient numbers of monitors and reliable communications channels, it would take only a short period to determine which areas in Canada were unsafe to anyone not in a shelter, which had received only small amounts of fallout, and which had received no radiation at all. Alternatively, without such knowledge, we would have no reliable way of knowing which Canadians could safely leave their shelters and which, were they to do so, would surely perish.

A large part of the problem of radiological defence could be sheer lack of knowledge: knowledge of the time, type, and size of each nuclear detonation that occurs on, over, or adjacent to Canadian territory. The factor of time is important, because radioactive fallout reaches its peak fairly quickly and then begins gradually to subside. The type of explosion is important, because air bursts produce almost no local fallout but ground bursts produce a great deal. The size of the weapon directly influences the lethal radius of ground zero and the amount of radioactive debris there is to settle downwind of the immediate target. As well, accurate wind and weather readings at and above the target area would facilitate projections of fallout patterns in the hours and days thereafter.

However desirable it may be to have these kinds of knowledge, wartime circumstances may make this difficult or impossible. For another part of the problem of

radiological defence is that formidable technical barriers to post-attack communications of any kind,- a subject discussed in the next section,- may preclude the rapid transmission of fallout information along the network. Even more fundamentally, most of the instruments we have to rely on to measure radiation are not now present in our local communities, and may not in any case have been maintained in good operating condition.

Local area monitors might be more or less on their own when their special expertise is most needed. Indeed, having and maintaining in readiness a network of trained radiation monitors with reliable equipment has proved, and is still, the most challenging part of the overall problem. In most provinces we shall have to begin anew virtually from scratch.

Actually, two distinct networks will be needed. The first network is required to ascertain quickly the general Canada-wide situation -- determining whether, and which, potential targets in Canada had been attacked directly; predicting the extent and likely pattern of fallout resulting from detonations in Canada and in contiguous areas in the United States; and identifying the regions of the country that may have been spared either kind of damage. As described in present plans, the foundation for such a network could be the surviving elements of the Canadian Forces, the Ministry of Transport, and other groups serving on an emergency basis.

The second required network must contend with the possibility that the distribution of fallout across Canada could be complex and variable. Within the limits of a single metropolitan area, corridors of comparative safety could be adjacent to zones where radiation is present in concentrations that no unsheltered human being can long absorb. It is, therefore, imperative that a network of local area monitors be in place and capable of identifying safe and unsafe areas, and of disseminating appropriate information, both on the threat from initial and short-term radiation and thereafter on residual contamination.

The deceptively simple problem of radiological defence at the local level has not been solved. While the nature of this requirement has not fundamentally

changed over the years, we are very far indeed from having an operational capability to perform this essential function in our towns and cities. The remarks on radiological defence in section 3 are devoted to some concrete steps that might be taken to solve this continuing problem.

Warning and Survival Readiness

Warnings are predictive assessments of the period of time remaining before a nuclear attack on Canada will occur, or its impact will be felt. As in the 1960s, analyses of the function of warning continue to distinguish between Strategic Warning and Tactical Warning. The former refers to indications that a nuclear attack on Canada appears likely; the latter to signs that such an attack is imminent or has actually been launched.

By contrast, the survival readiness phase, in the context of a growing international crisis, is that period of time during which the national state of civil preparedness for war would be raised from its peacetime levels to a state of total readiness. This phase would be initiated by government as a prudent reaction to initial and substantial deteriorations in international relations. The duration of the Readiness phase would, hopefully, correspond to the time required to upgrade public protection arrangements to a state of total readiness.

The Survival Readiness Phase

Very few historians or military theorists expect nuclear war to erupt without a preceding sharp deterioration in international relations. This might be adequately tracked by attention to overt governmental actions and pronouncements, supplemented by intelligence and media reports.

No one really knows how quickly a perceived crisis might carry us to the intercontinental nuclear threshold. This patently would depend upon the origins, intensity, and the dynamics of the situation, and upon events that would be very difficult to keep under control. However, the escalating crisis preceding a general nuclear war would likely include a period of

conventional warfare, and possibly the use of nuclear weapons in Europe or at sea.

If early danger signals were acted upon, the Survival Readiness phase would be devoted to finalizing and strengthening our passive defence arrangements. However, time will be of the essence in improving our current level of wartime public protection on a crash basis. Whatever time is available may not be enough. Many years of experience have shown that civil defence is a difficult program to fund adequately over time. The ideal goal of reaching and sustaining a constant state of complete readiness in public protection would very likely prove unacceptably expensive, particularly during any prolonged period of international calm.

It is necessary, therefore, to reconcile and balance these two factors: the desirability of longer periods of time in which to implement costly crisis preparations, and the realism that there are no reliable long range indicators that nuclear war is a finite time away. This balance, in practical terms, falls between what we should achieve and sustain in advance, and what we can afford to leave until developing crisis signals of different kinds manifest themselves.

Currently, for planning purposes, a nominal period of thirty days is considered appropriate for the Survival Readiness phase. While there is no definitive resolution to the conflicting pressures and diverse scenarios that could arguably lead to either shorter or longer time frames for crash upgrading, this thirty-day premise is not implausible. But it should not be interpreted as an expectation or prediction. In essence, this period serves to describe the level of preparedness for war that ought to be developed and sustained even in time of peace. However, there are three key activities which must always be maintained in a high state of readiness. These are the attack warning system, crisis public affairs arrangements, and crisis management decision systems.

Strategic Warning

Once a crisis in international relations has become sufficiently ominous to precipitate a prudent Canadian decision to initiate measures associated with the critical preparation period, the crisis may follow one

of three main courses: improvement, stagnation or further deterioration. The ultimate result of the latter course may be armed conflict which could include or eventually lead to nuclear attack on North America.

On the basis of current intelligence capabilities within the NATO Alliance, it is conventionally postulated that, before any large scale attack took place, a period of 7 to 14 days could be expected during which an attack appeared to be highly probable. This is termed the period of "Strategic Warning".

The strategic warning period thus covers only the tail end of a continuously deteriorating crisis. It is not the trigger to begin upgrading public protection. With good fortune, it would occur sometime after the completion of the Survival Readiness phase, or it might coincide with the last few days of preparation. Even in that instance, it would serve to accelerate the most feasible short-term protective arrangements, while de-emphasizing others with longer implementation requirements.

Tactical Warning

Given that Tactical Warning means an attack is imminent or has already been launched, potential targets in North America are no more than minutes away from ground or submarine-launched strategic missiles. Each of these minutes is precious, and an effective attack warning system would help Canadians to reach prepared shelters or to improvise expedient shelters in the all-too-brief period before nuclear detonations occur and radioactive fallout begins to settle.

Our present system of tactical warning relies on a network of ageing sirens, activated through ten provincial warning centres. On a signal from NORAD, the Prime Minister or Warning Staffs would order the sirens sounded, a signal to all Canadians to take protective cover immediately and tune in to the Emergency Broadcasting System for information and survival instructions.

The technical aspects and alternatives are discussed in section 3, concerning whether further investment should be made on sirens, and if so, on what aspect of the network.

Public Information

An effective program of public information is a precondition if governments are to be of material value to the people of Canada both before nuclear attack and thereafter.

This subject will be discussed generally, as public information is a function that aggregates many others, both technical and non-technical alike.

Currently, whenever governments have an important message to disseminate they have a variety of ways to do it. Position papers can be issued; press releases composed; pamphlets and brochures can be printed and distributed; and radio, television, and the print media can be inveigled or commissioned to carry the message. In cases of perceived or persistent need, intergovernmental conferences, public meetings, and seminars can be held, and suitable instructional materials can be developed for use in the school system. Those initiatives will both reflect opinion and reinforce it.

The absence of spirited efforts to keep a policy or program in the public view does not, however, condemn it to perpetual obscurity,- not automatically anyway. Some issues never go away. Others, plainly, are more vulnerable to being forgotten, though they are not necessarily less important because of that than those that succeed in remaining topical.

The subject of wartime public protection is a rather special case. It was once the object of quite extraordinary efforts to inform the public by means of all the techniques mentioned above. It no longer is. There is a low level of popular awareness of the real nature of the threat to Canada from nuclear war and of the life-saving promise of the countermeasures that are possible. The television film The Day After at least made the general subject of public protection against nuclear weapons very topical. This public interest may well subside, if judged by the erosion of awareness that has occurred since the 1960s.

This boom-or-bust cycle of public interest is a persistent, if not very helpful, reality which must be catered for in the years to come. Clearly, the best time to inform people about what can be done to survive and to try to recover from nuclear war is before the

need to do so becomes necessary. As it happens, the attention of Canadians is normally under active siege from every quarter, and most of us are not inclined to devote time and energy to solving problems we do not believe we have.

But to disseminate information actively only on receipt of strategic warning signals is to compromise the ability of public protection programs to work. This holds particularly for messages asking individuals and families to carry out preparations, alone or in conjunction with others whom they may or may not know. A crisis environment does not make it easier for people to undertake unfamiliar actions in a calm and efficient manner, it makes this more difficult. In other words, the time to educate Canadians about preparations that will, in fact, require some advance effort on their part, is well before a crisis.

Section 3 sets out a four-part program to restore a solid foundation of continuing awareness about nuclear war and wartime public protection.

The "Pre-Attack" Period

Most of any residual lack of public interest in survival matters will evaporate rather quickly at the first suggestion of real danger. All Canadians, and many for the first time, will want guidance, direction, assistance, and reassurance. They will be inclined to seek out and to try to follow the advice they receive from their governments about protective measures for which sufficient time remains.

There is a need for an emergency broadcast system that can be activated to furnish information on self-help measures early in the pre-attack period. While optimal arrangements would extend to private carriers and stations, at a minimum the full resources of the radio and television networks, both French and English, of the Canadian Broadcasting Corporation/Radio Canada should be put at the disposal of the federal government on a round-the-clock basis in the early stages of any international crisis portending war. Contemporary information materials must be developed for transmission directly to vast audiences, information that will almost certainly be very different from that

being offered by the American media at roughly the same time.

Existing arrangements also call for daily newspapers to publish information on fallout protection at what could be a fairly late stage of a crisis. However, the time to solve the problem of fallout shelters is already upon us. The precious hours and days of what could be the pre-attack period should be given over to ensuring the livability, not the existence, of fallout shelters. Newspapers would perform a more valuable service by emphasizing this now and printing later the guidance that may help shelter residents cope with shelter life.

Of course, what may appear to be a "pre-attack" period may come and pass without attack. Some professionals are on record stating that a period of build-up, if followed only by a relaxation in tension, could become part of any unwelcome cycle that could repeat itself with most unfortunate consequences: having several times been warned without reason, the public may fatally neglect the next warning. In any case, much can be learned about our true state of readiness from any crisis severe enough to require this level of response, not least being the adequacy of our emergency public information and warning arrangements.

After Attack

One little-known benefit from the atmospheric testing of nuclear weapons is the discovery of electro-magnetic pulse (EMP), a powerful force that accompanies every nuclear detonation whether on land, in the air overhead, or in the outer atmosphere. What EMP is in scientific terms need not concern us here; our emphasis is on the threat that EMP poses to all forms of electronic communications during and following nuclear war, particularly the transmission of information to and from survivors. This threat is simply stated: EMP may knock out of commission most commonly-available electronic devices, like radios and automobile ignitions and telephones and hydro-electric transmission systems, when our need for them could not be greater.

The strategic significance of EMP is apparent, in that a single high-altitude detonation over the territory of an adversary could devastate all

unprotected electronic aids to command, control and communications for hundreds or thousands of miles. Whether such a deliberate use of nuclear weapons makes much military sense is a matter of some dispute; it may not be wise to interrupt communications in many foreseeable situations that fall short of full-scale nuclear war.

However, the temptation to inflict crippling damage on electronic communications for negligible costs will probably prove irresistible. It follows that any contemporary effort to provide public information in post-attack conditions must anticipate wide-spread damage from EMP, both nationally and locally. The concentration of our most sophisticated communications technology in our great cities means that Canada's telecommunications systems are doubly vulnerable to EMP.

For those who wish to send and to receive messages from point-to-point, along a radiological defence network, for example, or between the governmental emergency operating centres, EMP must be defeated by the advance installation of protective devices. To the extent that external sources of electrical power or normal telephone lines are to be relied on, alternative means of generating power and transmitting information must be developed. While system shielding, and the installation of special limiters, filters, and surge arrestors can help, the situation we now face is that virtually the entire civilian communications and electronics resources of Canada remain openly vulnerable to EMP.

From the point of view of the individual or family, EMP cannot be satisfactorily dealt with after the fact. Simple procedures can be used to neutralize the impact of EMP on small devices like portable radios, but only if carried out before the fact. These precautions could also allow shelter-to-shelter communication, or the reception of broadcast messages -- if emergency broadcasting facilities have been hardened sufficiently to withstand EMP.

There is no clear indication that we have even begun to cater for the problem of EMP in our public information arrangements. There are no guarantees, in other words, that governments or other agencies with

vital information needs and roles will be able to communicate these beyond the immediate confines of their own shelters. Nor is the general public aware of the threat from EMP. The people of Canada could be very much on their own if these deficiencies are not rectified, and could turn for leadership to those whose instructions are audible if neither authoritative nor wise.

To be of material value to Canadian survivors, governments in the post-attack environment must be capable of responding to quite elementary information needs. People sheltered will need to be told whether or not it is safe to leave their shelters. Hungry and injured survivors will need to know where they can turn to for food and medical attention. Canadians generally will wish to know the extent of devastation across Canada and whether some parts of the country have come through without damage. Everyone will need potable water eventually, and where it may be found -- and where it cannot be assumed to be -- is a foreseeable question in every town or city. At a later stage, farmers will need to know how to determine whether livestock has been dangerously irradiated, and whether lands covered by radioactive fallout are irredeemably lost.

In brief, beyond developing the technical means to broadcast information to survivors, governments must also take steps to insure they have something of value to say to them. We return to these matters in section 3.

Essential Services

Essential services includes emergency social welfare services, policing, fire-fighting, rescue, transport, medical care, food distribution, housing, and the restoration of public utilities and other services,--all to be conducted in the aftermath of nuclear war. They are grouped in this way to permit the general discussion that, in view of certain similarities described below, is deemed to be most valuable.

In considering essential services, it is acknowledged once again that the direct attack would have a devastating effect on Canadian cities, and that nothing could adequately protect them from damage by

nuclear weapons. But in this context, direct attack carries an even more insidious price to be paid nationally, for it would sharply reduce the resources we would be able to apply to survival, while multiplying the priority uses just such resources must be applied to.

In Canada and in other developed societies, this problem is greatly compounded by urbanization which continues to concentrate administrative and technical expertise, as well as vital survival resources, in large metropolitan areas that themselves are liable to attack. We are not going to change this very much, but we can recognize the vulnerability it produces. Some steps could be taken to reduce this vulnerability by dispersing now concentrated resources, by anticipating operational problems, and by seeking avenues of preparedness most in keeping with our capabilities.

In this connection, Canada has inherent strengths almost unparalleled among the developed societies. We are both a federal society and a federal state; strong regions are governed by strong provincial governments that would be invaluable resources for national survival. We have, as well, a tradition of local self-government, and able municipal governments long active in such fields as law enforcement, fire-fighting, rescue operations, and emergency housing and welfare services. Even Canada's vast geography, so frequently cited as a barrier to national cohesion, is a real asset, reducing our vulnerability to complete annihilation.

There will, to repeat, be Canadian survivors of any plausible nuclear war. Indeed, many towns and cities and, with any luck, entire provinces could conceivably escape direct and indirect damage to emerge virtually intact. Resources within them could provide a substantial foundation to sustain survival, and the more of them, the better.

But the potential for effective action provided by this foundation might not necessarily be realized. There is nothing automatic about a process by which assets and resources are intelligently applied to problems, and, without advance planning, failure would be the most probable result of any crash efforts made in the special context under consideration here. Nor is advance planning enough. It must be adequately advance

supported by political commitment, firm policy, and sufficient resources.

The best use of surviving resources and capabilities in the post-attack environment might not be readily apparent, even to the experienced. Operational effectiveness will presuppose accurate information, for one thing, which could be in very short supply. It would presuppose, as well, that all levels of government have taken the time to develop the means to make and to implement decisions whose character would be radically unlike those that give them sufficient trouble in peacetime. It is, perhaps, too easy to say that the optimal decisions will serve long-term goals when the immediate circumstances facing decision-makers will include appallingly numerous and competing short-term priorities.

In the aftermath of nuclear war, the demands on public and private sector agencies required to perform essential services will likely overwhelm their very modest capacity to respond. In one form or another, authorities in most of these surviving agencies would face the same cruel dilemma: how best to utilize obviously insufficient resources at a time of limitless need, without much advance thinking to guide them.

Whenever and however this dilemma arises, there will be many opportunities for error. Irreplaceable medical supplies, for example, could rapidly be exhausted treating terminally-ill patients; animal feed could be allocated to livestock fatally exposed to dangerous radiation, scarce fire-fighting equipment could be requisitioned and jeopardized in areas where even heroic efforts would have negligible impact. We could, equally, turn inward to try somehow to make do when valuable assistance may be nearby and available. Family households could become armed camps, although effective policing might be had for the asking.

There are no easy answers for these puzzles. Also, our ability to organize, perform, and coordinate essential services in the post-attack period has diminished with the passage of time. There appear to be several distinctive, but complementary, paths to travel toward the objective of enhanced preparedness in this area.

With regard to the concentration of survival resources in vulnerable urban centres, we could redouble our efforts to create first-rate emergency stockpiles in less vulnerable parts of Canada. There is little doubt that the most immediate and pressing dangers facing survivors will be acute shortages of food, potable water, warm shelter, and medical care. It should not be beyond us to identify and place appropriate supplies in trust for a purpose that we all hope will never be realized.

In the field of health care, doctors, nurses, and medical para-professionals will no doubt want to minimize individual suffering among those caught by the direct or indirect effects of nuclear weapons. What will be needed to serve this commendable goal is the skillful application of techniques of medical care for spartan environments, techniques only distantly related to the sophisticated means of treatment that are the foundation of current medical care: the rapid deployment and use of emergency field hospitals, with equipment and supplies limited to what may exist in emergency medical stockpiles. A contemporary arrangement should be developed and maintained, in full consultation with the Canadian medical services community, for the concepts of austere medical care, medical stockpiles, and training.

Nor are health care professionals by any means unique in having little beyond good intentions to rely on, if worse ever comes to worst. In each essential service we can, and we should, do better at identifying and putting in reserve the materials we might one day need and at insuring that a cadre of skilled personnel is able to see to their effective use.

Similar concerns apply to the real value to be derived from towns and cities fortunate enough to have been spared damage. Every Canadian city -- Halifax, Kamloops, Montreal, Lethbridge, all of them -- must be regarded as both possible targets and as potential strongholds for survival. The capacity of any city to serve effectively in this latter role is a function of the standard of emergency preparedness it has achieved in peacetime. Each urban police force, fire department, hospital, wholesale grocer, and social service agency could one day be one of the few still capable of operation inside any given province. When considered in

this light today, it would be well to ask about the status of civil emergency and disaster planning within these institutions, about their capabilities to conduct unusually demanding operations in highly unfavourable conditions.

It is always difficult for these organizations to devote thought and time to hypothetical problems when so many others are real. Suffice it to say that the major institutions in most Canadian cities would find it very difficult to meet the needs of local residents in the post-attack period, let alone the survivors in areas suffering direct damage or fallout.

It is necessary to recognize that survival very quickly becomes a highly local matter, deeply dependent on capabilities that must be in place when needed. To overlook this most immediate aspect of preparedness is to run the risk of undermining the benefit of all the others. In section 3, it is recommended that provincial and municipal governments play a more active role in fostering and coordinating civil emergency planning in local public, para-public, private-sector, and voluntary organizations. No national effort can be stronger than the parts that constitute and express it at the local level, but municipal government cannot fairly be asked to act alone and unaided to meet wartime requirements.

Remedial Evacuation

This operation could be needed as early as a day or two into the post-attack period, or as late as a week or more after a nuclear war has been waged and, presumably, ended. It stems from the possibility that parts of Canada may have been rendered incapable of sustaining life by direct damage or by heavy fallout, and that individuals, sheltered or otherwise, within them must be found, relocated, and resettled in order to stand any chance of survival.

Classically, remedial evacuation is to be carried out once radiation levels have subsided enough to permit short sorties into affected sectors to inform people within them that they are to be moved, and to gather them up and leave. It addresses the threat that very

high levels of radiation pose even to those in well-prepared fallout shelters,- the kind that would probably prove adequate in most regions of Canada. Although it is a remote possibility that areas home to a majority of Canadians could simultaneously be covered by deadly fallout, remedial evacuation may not be needed on this scale. But a great deal obviously depends upon the extent of direct damage in Canada, and on the direction and strength of the winds wherever nuclear detonations occur.

Apart from the scale of the planning effort that would be needed, a further uncertainty must be contended with; namely, that remedial evacuation requires well-trained individuals who must be willing to expose themselves to danger by entering badly-contaminated sectors. No one could, or should, force them to do so, and many might be reluctant or unwilling despite careful preparation. This doubt will be expressed again and helps to explain the importance placed on both the technical and non-technical means to strengthen fallout shelters.

We nevertheless confirm the basic validity of the operational concept in discussion here. It describes a foreseeable requirement if we are genuinely dedicated to minimizing the casualties from nuclear war.

Such an assertion does, however, underestimate the magnitude of the effort needed to plan and conduct a sophisticated life-saving operation like remedial evacuation. To develop some capability in this area we would need to have an effective radiological defence system at the local level. We would need to be aware of at least the major public fallout shelters in the affected sectors, and we would need a means of communicating with each of them. There may also be many thousands in private or expedient shelters who may be difficult to contact except by block-to-block canvassing. We would need volunteer drivers and sufficient numbers of large vehicles to evacuate those ready and able to leave. We cannot presume that, without advance work, roads will be passable or that motor fuel will be plentiful. Nor can there be any guarantees that evacuees who have been subjected to significant doses of radiation will survive without skillful and timely medical attention. Thus, we would need to have suitably distant, well-organized, and

welcoming reception centres to process, care for, and resettle individuals and families.

The development of these capabilities would provide a base on which it would be meaningful to plan remedial evacuation. The absence of such a base would make such an expenditure of time and money senseless. Achieving a full measure of competence in remedial evacuation is a need that may have to be deferred for some years, pending work of a largely remedial character.

Reception

Reception, the capacity to receive and care for wartime refugees and evacuees, is a particularly difficult yet valuable component of our passive defence arrangements. It is a difficult component because reception planning raises the issue of expectations: just what an arriving individual, small group, or family (probably Canadian but possibly American) may justifiably expect from others in horrendous circumstances. It is a valuable component because reception, while not a life-saving operation, is a life-sustaining function in the battle for medium-term survival.

More specifically, in the civil defence literature surveyed, reception communities are made notionally responsible for such activities as arranging to receive evacuees at railway stations, important road junctions, and docks; applying a system of registration, inquiry, and family reunification; providing emergency welfare services, among them lodging, feeding, and clothing; establishing and enforcing transportation, traffic, and parking controls; securing timely medical attention for the ill and injured; issuing authoritative advice and guidance to the public; and finding adequate fallout shelter for each arriving individual.

All who act on the assumption that "reception communities" have freely accepted this designation and have prepared themselves accordingly are in for a surprise. As a generalization, it is safe to say that very few Canadian cities, towns, or villages have devoted more than passing attention to these purported responsibilities for more than two decades.

It is nevertheless apparent that the specific tasks assigned to reception communities are extremely important ones, and not just for evacuees and refugees. The society of survivors that makes no provision to perform these functions need devote little thought to the prospects for an eventual recovery. Whether considered as the responsibilities of reception communities, or as essential services to be provided in the aftermath of nuclear war, some considerable effort is plainly required.

The foundation for such an effort is technically present in our local communities in the form of police, fire, social service, food distribution, hydro-electric, and transit agencies, etc. But we are inclined to doubt whether most of our municipalities will ever be able to carry out the duties classically assigned to reception areas over an indefinite time. They should be encouraged to do more than they are doing, but long-term reception requires a more selective approach.

In Sum

In this section an attempt has been made to review the general subject of wartime public protection by identifying and briefly discussing its principal components. We have sought to use non-technical language and concepts, and to frame the presentation at a level general enough for the reader who is new to this subject.

There are two further observations to be made. First, we would underscore the systemic character of the preparations Canadians require vis-a-vis nuclear war. Each of the individual activities described is very much worth doing, but none is worth doing in isolation. A failure to attend to fallout shelters, for example, would jeopardize any accomplishments we might make in radiological defence or in warning. We need, therefore, to develop these capabilities in a cumulatively reinforcing manner to establish the overall system of wartime public protection that has heretofore been lacking.

Second, no single order of government can solve these problems on its own: a cohesive partnership is needed. Yet it should be stressed that no once-and-for-

all spasm of intergovernmental activity will suffice. To nurture an amount of wartime public protection that is more than an illusion of preparedness will require years of very careful management. Diverse, changing, and highly independent actors in government, in industry, and in the voluntary sector will need to find real satisfaction in the parts they will be asked to play. Success in launching and sustaining this process of renewal will be proportional to our willingness to face some very old issues and some very new problems. Ancient and murky legal questions will have to be answered. Increased resources will somehow have to be found by governments at every level. Perhaps most importantly, new and cooperative working relationships will have to be forged among those more commonly in seeming competition with one another. None of this will fall magically into place; it will require compromise, conciliation, and, with these, steady progress.

SECTION 3

A CLOSER LOOK

Current Concepts

The terms of reference given to the Task Force included a review of "concepts of operations" in wartime public protection that have been developed over the years. A concept of operations is basically a programmatic or step-by-step listing of the specific tasks making up a larger operation like warning or remedial evacuation. The intent is to divide the overall function into smaller parts, in precise but general enough language to serve as a reliable guide for those charged with carrying out the operation wherever it may be required, but especially at the local level.

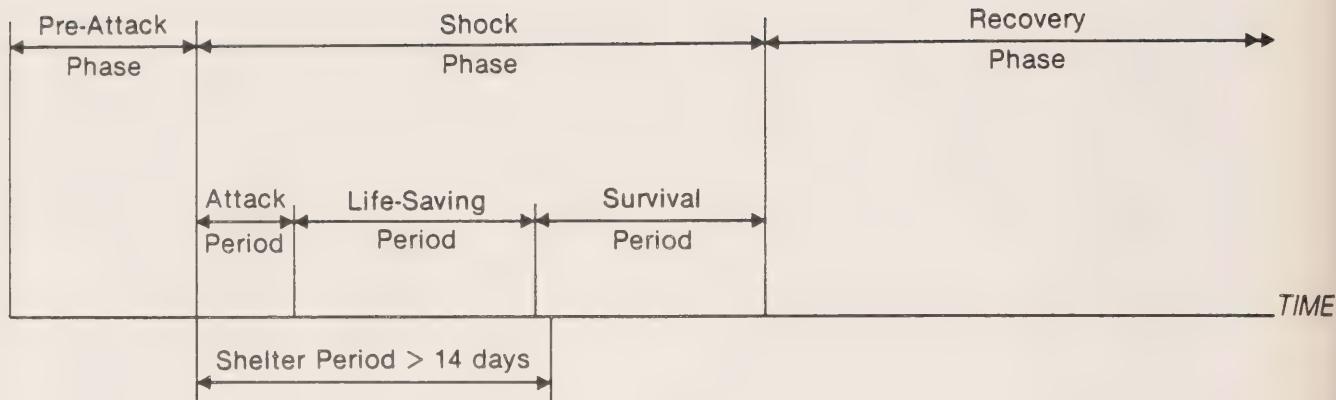
Most of the concepts of operations in civil defence that the Task Force was able to locate in a lengthy search date from the 1950s and 1960s, and a few go back to the Second World War. Specific titles and further discussion of these concepts of operations are listed in the bibliography.

Judged from the mid-1980s, surviving concepts of operations in civil defence suffer from three problems. The first is that time alone has taken its toll on concepts of operations developed in the 1960s. The second is that they probably underestimate the danger that any nuclear war would pose. Direct damage was anticipated in all parts of Canada, caused by much larger and more destructive weapons than those currently deployed or scheduled to be. On the other hand, specific impacts like electro-magnetic pulse and more encompassing dangers, such as the atmospheric and ecological effects any plausible nuclear war would produce, were never addressed.

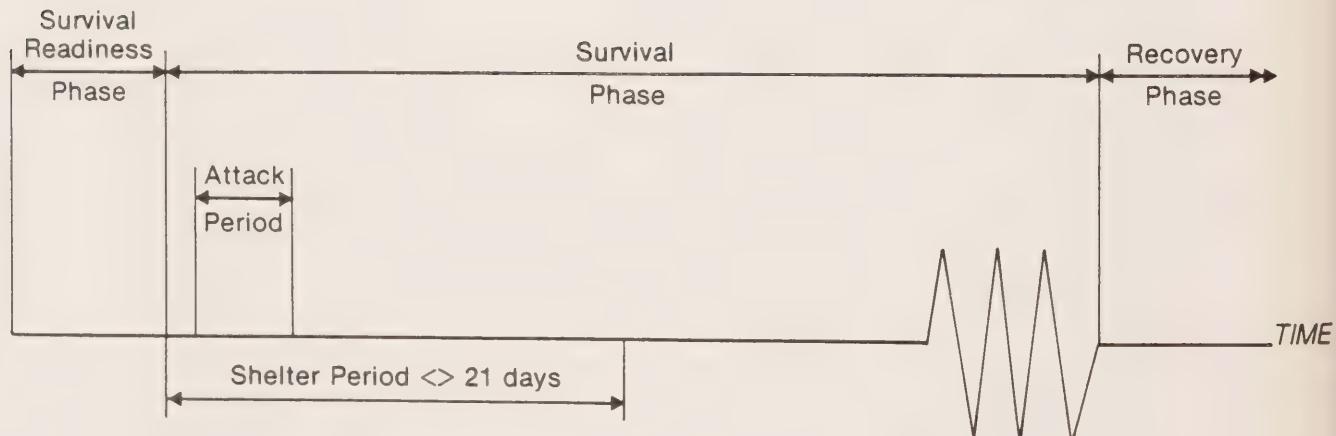
Accordingly, the focus of most concepts of operations is on activities to be conducted in a relatively brief period, the first two or three weeks following nuclear attack. This "shock phase" is usually sub-divided into the period of attack itself, the "life-saving period" when initial rescue operations and remedial evacuation may be carried out, and the "survival period" during which the surviving population

Figure 1 — Phases of Operations

Old Concept:



Task Force Concept:



could be stabilized and sustained. As early as 14 days after attack, corresponding to the observed rate of decay of early fallout, the "recovery phase" would be entered when reconstruction and rehabilitation could be begun.

Figure 1 shows a different approach to these phases. Earlier, the report described the Survival Readiness Phase. This is followed by the Survival Phase, which may be perceived as beginning whenever Canadians are directed to adopt fallout protected shelter. Within this phase, should an attack occur, fallout predictions and warnings would be issued, damage assessed, and life saving operations conducted. At the same time, it could be several months, or even longer, before productive work -- anything beyond scavenging and salvage -- could safely and fruitfully be resumed in much of the country.

Relatively low-cost preparations could succeed in keeping millions of Canadians alive for the first few weeks after any conceivable nuclear war. However, the struggle for sheer survival could last for a much longer period than that envisaged in the traditional civil defence literature, which was based on the rate of decay of early fallout. Climatic or atmospheric conditions could preclude growing sufficient food to ensure that short-term survivors would not starve to death in the months following attack. Delayed fallout on a global basis could render very large geographic areas more dangerous to health than has been heretofore anticipated.

It follows that the survival phase would probably end at different times in different places. It follows, as well, that the recovery phase could be very long in coming in some areas, and requires our most careful attention to problems not yet tackled in the war planning literature.

The third problem in Canadian concepts of operations for wartime public protection is that they presuppose capabilities in wartime government that not only do not now exist, but that would greatly exceed the demonstrated competences even of peacetime government at any level. This is not a matter of technical error. Indeed Canada's state of preparedness to face nuclear war would be very much better if her cities could have

taken to heart such authoritative works as a A Guide to Civil Emergency Planning for Municipalities (EPC 10/79), and followed through on their recommendations. The root of our concern is practical, and stems from the fact that not a single local government in Canada has found it possible to live up to the notional responsibilities assigned to it for civil defence on a continuing basis, a comment which holds also for each provincial government and for the federal government.

The problem arises from the very character of the concepts-of-operations literature. What is emphasized is that each of the many important operational requirements we shall have in the aftermath of nuclear war can be met, provided that highly organized teams of trained specialists survive and closely follow the detailed guidance set out as concepts of operations in, for example, emergency health services, rescue, and emergency communications. While this task-centered approach is predicated on the undeniable assertion that coordinated and effective action in wartime requires careful advance planning, it also tries to solve the problem of nuclear war by grossly overstating the human and material resources available for this purpose. Few of the highly organized teams of trained specialists that represent the means to solve pressing wartime problems now exist, or have ever existed, anywhere in Canada. Its "technical" preoccupation with allocating narrowly-defined tasks among fictional organizations makes this literature vulnerable to the charge that it simply wishes away the impasse that has long prevailed, and prevails today.

Shelter Planning

Fallout shelter is the key component of a modern civil defence program for Canada for the 1980s and beyond, and should be based on a mixed strategy in support of the goal of adequate fallout protection for every Canadian. A considerable amount of expertise has been developed on shelters in the federal Department of Public Works and elsewhere, and it is from this foundation that the following discussion developed.

The mixed strategy advocated has four parts: a public shelter program, a program for private

residences, a program to assist dispersal where privately preferred, and a program in research and public information that extends to expedient shelters.

The Public Shelter Program

Since its inception in 1964, the Fallout Protection Survey of Canada has identified approximately twenty-five million spaces with the potential to serve as fallout shelters, exclusive of spaces in private residences having basements. Every structure now registered in the National Inventory of Shelter Space has a protection factor of at least 25, meaning that individuals within them would be subjected, at most, to 4% of the radiation in the outside environment.

Is this minimum degree of protection sufficient? The answer to this question is at once highly technical and inescapably judgemental. For those parts of Canada fortunate enough to have relatively light amounts of fallout, a protection factor of 25 could prove the difference between sickness and health. In less fortunate parts of Canada,- those down-wind of Canadian or American locations attacked directly,- the same standard of protection could mean the difference only between death and an urgent requirement for medical care. It would not prevent acute radiation sickness in these areas, although all such claims are generalizations subject to numerous reservations.

A cornerstone of a national commitment to fallout protection must be an acceptable universal minimum protection factor applicable to all forms of shelter in all parts of the country. Considerations of equity probably require this, given that public funds will be needed to achieve the goal of adequate fallout protection for every Canadian. For this purpose, we would recommend a value not lower than 50. This, in turn, would require that some modification and upgrading be carried out in some of the structures currently listed in the national inventory.

Because the inventory, and the provincial and community shelter plans based on it, deal only with potential fallout shelter spaces, it is now time to determine, in law and in fact, whether and to what extent this potential can be realized at the provincial and community level. As suggested above, the technical

part of this work must seek to raise the protection factors some listed structures afford. Each structure will likely pose a few unique problems. The federal government should select a representative sample of structures and undertake the physical modifications in each, for the sake of deepening our knowledge of shelter techniques.

The federal and provincial governments, at the same time, should cooperate in selecting and putting in place the low-technology equipment needed for ventilation, cooling, sanitation, and personal hygiene. Dozens of private sector firms now offer competing shelter-relevant and "survivalist" products that should be evaluated in such field tests. A few shelters should be stocked with water, food, medical supplies, and bedding during these trials. In bringing these sample shelters to a true state of readiness, officials should keep careful note of all space requirements, costs, and problems to assist subsequent evaluations.

The Task Force believes that the period that some Canadians will occupy fallout shelters may exceed the two-week minimum period adopted in the literature we have canvassed. This period could begin a week or more before attack and last for a month or so after that. This suggests to us that the social relations considerations that are bound to arise during such a lengthy period of enforced confinement merit very careful study. Livability considerations will prove as important as proper engineering, in every shelter. They may lower the number of spaces inside any given structure that can be allocated to individuals, with every individual requiring more space than previously believed necessary.

In the classical literature, each public shelter is to have a trained shelter manager to manage life in the shelter, a subject which ranges from the technical aspects of emergency communications to the non-technical questions of shelter policy for a host of potentially troublesome issues, like rationing scarce supplies and establishing work routines. At this time, very few of the more than 70,000 shelter managers notionally required have actually been trained. It seems unlikely that the rest will be, at least in the near future, and there are more urgent uses for resources at this time.

The individuals who come to be assigned the spaces comprising each public fallout shelter should be asked to work with one another to solve their own problems to the fullest extent practical. This means that the onus would be upon them to cooperate in order to stock the shelter with essential supplies and to determine the ways they can make shelter life more tolerable. A big help to those grappling with such matters would be the federal government's production and distribution of new materials on shelter management for non-specialist readers.

Certain fundamental issues will, however, demand government policy and leadership. One is that most of the structures containing otherwise suitable fallout shelter spaces in Canada are not under public ownership and control. If there are legal barriers to this public use when required, these should be identified and struck down in law. The right of access and occupation is too vital to be a possible item for negotiation from one end of Canada to the other. One possible inducement to property owners to maintain shelter space would be the willingness of government to offset the capital costs of raising the protection factor of, and installing proper ventilation and sanitation in, every privately-owned facility designated as a public fallout shelter.

The second issue demanding government action is matching individuals and families with accessible and appropriate spaces in public fallout shelters. An important part of this work, a community's readiness plan, should have been completed before the Survival Readiness Phase has begun. The well-prepared municipality, in advance of the need, will have estimated community demand for public shelter spaces; will have located, marked, and, where required, modified the buildings that satisfy this demand; and will have issued periodic progress reports to the community so served. The unprepared municipality, on the other hand, could be swamped by sudden demand for public shelter space, and might find it difficult to maintain public order in and around the buildings that somehow come to be seen as possible fallout shelters. In every community, the Survival Readiness Phase must be devoted to solving problems quickly, but it is well worth remembering that Canadians have never before been faced with an international crisis serious enough to warrant sheltering. No one knows all the answers to the

questions that will arise when just such a crisis occurs. The provincial and federal governments can assist local governments indirectly by sponsoring alternative shelter approaches which reduce the aggregate demand for public shelter spaces. The second and third components of this shelter strategy seek to stimulate work along these lines.

The third issue before government is finding some reliable means of communication, so that those in public shelters can be advised of the level of ambient radiation in the external environment. In the absence of authoritative reports to the effect that shelters can or should be left, and in the latter case, of suitable sites for remedial relocation, well-protected individuals should simply stay put. While an ideal solution, it is unlikely that local radiological defence networks will ever extend down to each and every public shelter. Nor need they, provided that reports on fallout -- its initial arrival, its peak intensity, its rate of dissipation, and its residual amount -- can be communicated to those in public shelters by the means we shall describe presently.

With government leadership in these three key areas, Canada could have a public shelter program in place within the next five years. On a crash basis, the same goal could be met more quickly. At the same time, two other paths should be followed to reduce the overall demand in Canada for public fallout shelter spaces.

A Program for Private Residences

To achieve worthwhile results in wartime public protection at the least cost is to recognize and to build upon the valuable strengths and materials we already have on hand.

In the case of fallout shelters, our requirement is simply stated: Canadians everywhere need access to space that is both effectively shielded from harmful radiation and comfortable enough to be livable for a month or more. This requirement could be met by the construction of a national network of fallout shelters at a price that could not fail to total several billion dollars.

But if we have the ingenuity to recognize the inherent strengths of most single-family homes, we could achieve virtually the same desirable purpose at a small fraction of this cost. Every Canadian who is fortunate enough to live in a house with a below-grade basement should be helped to pay for, at the very least, the raw materials, and preferably some of the labour costs, he or she would face in constructing a serviceable basement fallout shelter. We recommend that the federal government in particular give careful consideration to a matching-grant program to help offset the costs to homeowners in seeing to their own wartime preparedness in this way. A program parallel in design to the Canadian Home Insulation Program might be considered, where the homeowner had the option to participate or not on a voluntary basis. The provincial and municipal governments should support and assist such a program by accepting federal design standards and funding procedures while looking after the program management and delivery aspects themselves. They should also be willing to rebate any sales taxes paid on the needed raw materials for basement shelters, and to forego property tax increases that might otherwise be levied on "home improvements" that might serve other purposes.

Past proposals of this sort have been greeted with some scepticism on the part of those whose support for such a program would prove decisive. To them and to the many critics of the outdated federal publications Eleven Steps to Survival, Your Basement Fallout Shelter, and Fallout on the Farm, a few words of advice: on a Canada-wide basis radiation, not blast, could be the deadlier peril, and the one we stand some chance of overcoming. We are not all going up "in a puff of smoke." Expectations of immediate death, if they govern our behaviour in the coming years, could be proved false. Immediate death, might, however, be preferable to what may befall us without adequate fallout protection.

Even after the need for fallout sheltering had ended, the longer survival phase foreseen may include a period of several months during which survivors might have to rely on their own resources to sustain themselves. It could be possible for many who had sought protection in public shelters to return home. Most Canadian homes can serve as warehouses for family

survival by housing stockpiles of food and medical supplies. But, like many motorists before the 1973 oil embargo, most of us still run our households "on empty", certain that resupply is a block or two away whenever we need it. This certainty, and the supply system that supports it, can disappear very quickly in an emergency.

The message is that Canadians should be encouraged to equip their homes to provide a measure of crisis self-sufficiency. The return on such investments can be very great indeed, and not just in the wartime conditions of paramount concern to us, but also in peacetime emergencies of many different types. Apart from food and medical supplies, every survivor will wish to have clothing, bedding, and some means of heating, cooking, and lighting -- all of which can be stored at home. As well, a battery-powered radio, together with a plentiful supply of spare batteries, should form part of the survival supplies of every family. The federal government should continue to make detailed guidance on home preparations for self-sufficiency widely available. Information on the many new "survivalist" products that have some long-term crisis value should be included in these materials, as should any uniquely war-related family requirements.

A Program to Assist Dispersal

Although the Task Force has concluded that crisis relocation planning on the American model is unsuited to Canadian conditions, this should not rule out some governmental effort to assist dispersal. In this context, dispersal means voluntary movement away from home areas felt to be in special danger from direct attack or from heavy fallout.

Indeed, it is idle to think that spontaneous dispersal could be prohibited during grave international crises when it alone may seem to guarantee survival, at least over the short term. Many Canadians living in our largest cities will prefer to take their chances away from home, and many Americans will regard nearby parts of Canada as less threatened or more promising relocation sites than those in the United States officially designated for this use.

The purpose of our comments on this subject is to underscore that the phenomenon cannot wisely be overlooked or forgotten. Experience with peacetime emergencies, like natural disasters and severe accidents, fully documents our tendency to deal with physical danger by escaping it. Anticipating and channeling dispersal, while seeking to foster its most positive and constructive manifestations, should be integral components of any overall approach to shelters.

As a first step in dealing with dispersal, we must take the time to develop a more thorough understanding of it than we now have. The subject has not been fully examined through survey research in Canada, although studies of American attitudes and orientations toward dispersal and related matters are plentiful. We cannot, however, rely on American data if we wish to understand Canadian beliefs and intentions.

It is possible that most Canadians who live in our largest cities now believe that their homes will suffer from direct attack if nuclear war occurred. It is also possible that the vast majority of Canadians with such beliefs also intend to disperse in advance of direct attack. It is even possible that some Canadians have devoted time and thought to where they would go and how they would sustain themselves while there. It seems more likely, however, that wherever dispersal occurs in any magnitude it will cause serious strains and problems, precisely because it will be spontaneous, ill-planned, and unplanned for. Very large sums could be spent to alleviate these stresses, notably in trying to prepare small towns and rural areas to serve as reception communities for an avalanche of incoming urban residents. This is not recommended.

We should, however, seek to estimate how many Canadians may resort to dispersal, where they would go, how they would get there, and what preparations, if any, they have made wherever they seek to settle. Such subjects are eminently suitable for exploration through survey research conducted at the local level as well as regionally and nationally, and the federal government should begin a research program along these lines.

Second, Canadians intending to evacuate their areas of residence in advance of actual attack should be

formally put on notice that no special arrangements to receive them have been made anywhere in Canada. The Task Force has already stressed the need for new public information materials to assist those dispersing to achieve self-sufficiency for a protracted period. Perhaps Canadians should, as well, be strongly encouraged not to disperse if they are unable to bear most of the burden of their subsequent care. In the circumstances of a mounting crisis, no one should simply assume that he or she will be adequately sheltered, fed, and cared for by others in unfamiliar surroundings. Individuals or families who have cottages or friends and relations with homes in areas deemed remote from danger do have a potential advantage over those who do not, but even here the needed agreements and arrangements should be completed well in advance of real danger.

Third, a modest governmental program to assist dispersal should also extend to financial support for preparing the fallout shelters of individuals and families who privately prefer it. This amount should not exceed the average amount homeowners would receive in subsidy for the construction of basement fallout shelters. Any such assistance would also be limited to the materials, labour, and taxation offsets for a fallout shelter at another verified location. It would be granted in lieu of assistance for preparations in the principal residence.

Fourth, once we have some empirical evidence on the volume and location of potential dispersal in Canada, all orders of government should anticipate the strains and stresses it could cause. These might range from the collapse of the telephone system to local breakdowns of public order. At a minimum, spontaneous dispersal during a crisis could place our highway system in some jeopardy. Thus traffic control, load restrictions, and emergency road and bridge repair may be needed to avoid massive tie-ups and bottlenecks. Access to some towns and villages may have to be restricted. Supplies of gasoline, diesel fuel, and heavy equipment should be prepositioned along major routes. Make-shift hostels and camping areas may be required. Police and highways personnel may have to be vested with special authority to direct and control the process.

In the absence of suitable research materials, we are unable now even to guess at the scale of the

governmental efforts that may prove necessary to channel dispersal even along the minimum lines just mentioned. On the other hand, real success in developing our public and private fallout shelters could reduce the number of Canadians who might resort to dispersal in desperation. That some organized effort will be needed to control dispersal we do not doubt, but we do not favour action without further careful study in this sensitive domain.

A Shelter Research and Information Program

The Task Force has had to ponder real and Canadian conditions, not ideal and off-shore models. In this connection there is much to be gained from serious research, both original research formulated and undertaken in Canada and secondary research based on Canadian replication of off-shore study. This seems especially true of research into all forms of shelter, and we recommend that the federal and provincial governments jointly create a program of assistance to qualified researchers.

Apart from research into dispersal, one emphasis of such a program should be expedient fallout protection in Canadian conditions. Here even titles from the Soviet Union and China might be reviewed for potential application in rural, isolated, and northern communities where building practices vary greatly from the urban and southern norms. A related emphasis might be low technology ventilation, air filtration systems, and the means of securing sufficient heat in winter for private and expedient shelters. Consideration should also be given to the shelter implications of the fact that increasing proportions of our population live in high-rise buildings and in other medium-to-high density types of housing.

The widest possible public diffusion of accurate information on shelters and associated technologies is an allied but different activity. Federal booklets still being distributed, are an inadequate foundation for the public information component of the national efforts in shelters. A generation of well-educated Canadians has reached adulthood since government last sought to inform the general public about the threat

from radioactive fallout and how shelters could help to meet it.

This void has to an extent been filled by the growth of the "survivalist" literature, perhaps best represented by Bruce Clayton's Life After Doomsday (New York, The Dial Press, 1980). But the tone of such works is distinctly pessimistic about the effectiveness of "official" civil defence programs, and a good deal of attention is devoted to how dedicated individuals and groups can make up the shortfalls in public programs. Not all of this information is accurate, and not all the advice is sound. But the level of sophistication reached in the best of this literature should serve as an informal benchmark about the needed qualities of any governmental publications seeking to cover the same ground.

Radiological Defence

It is not difficult to conceptualize the ideal system for radiological defence. It would have three principal features. First, it would serve all the provinces and territories of Canada -- rural areas, towns, and major metropolitan centres -- equally well in both peacetime and war-related emergencies. That is, it would be able to detect and report on very low levels of radiation of different kinds, partly to deal with peacetime nuclear emergencies made more common by the domestic production of nuclear power and the use, transportation, and disposal of radioactive materials, and partly to deal with residual contamination produced by fallout during war. Of course, the same system would handle the much higher and more concentrated level of radiation that would be a shorter-term effect of nuclear war.

Second, the ideal system would be highly automated. It would thereby minimize the necessity of relying on human beings who sometimes make errors, are vulnerable to radiation sickness, and may not be willing to expose themselves to the uncertainties of manual radiation monitoring. Instead, remote sensors would detect, and instantaneously report to a protected central control station, various forms of radiation in any measurable intensity.

Third, the system would never fail. Although acutely sensitive to radiation, it would withstand extremes of weather, the ravages of nuclear war, and the passage of time. Neither technical failure nor human error would occur; if a remote monitor indicated no radiation was present in a surveyed sector, it would in fact be perfectly safe to remain or return there. If it indicated low-level leakage or some residual contamination, decontamination operations could be carried out with the assurance that the amount of radiation had not been grossly underestimated. Higher readings would mean that decisions to evacuate an area, to counsel continued sheltering, or to stay away entirely could be taken in absolute confidence.

One day the technology may exist, and by that time it is conceivable that the money to pay for it would exist as well. For the present, neither does. We recommend continued research and development on the technical foundation for the ideal radiological defence system, although in the near-term we must address ourselves primarily to the old problems still plaguing present arrangements. This review shows that these problems are not largely of a technical nature.

As early as 1959, the Canadian Army was charged with the responsibility of warning the public of nuclear attack, including the threat from fallout. A system to monitor radiation on a Canada-wide basis was developed, and some 2,000 monitoring posts were created for this purpose. These, unfortunately, no longer exist. A more articulated network needed in local areas was discussed at the Dominion-Provincial Conference on Civil Defence in 1961, and a rather formal division of labour among governments was negotiated.

Municipal governments were asked to organize a radiological defence service capable of detailed monitoring of radiation hazards within the municipal area. This extended to the recruitment and some of the training of personnel to be drawn from such local agencies as police forces, fire departments, public utilities, and even high school teachers on a voluntary basis. Local governments were also asked to identify their requirements for the radiation detection instruments needed locally.

Provincial governments were asked to serve as an intermediary between the federal government and local governments, sharing the cost and seeing to the distribution of radiation detection instruments to the municipal level. They were also asked to undertake the bulk of the training of municipal monitoring staff, and to develop radiation experts to assist with provincial emergency operations under conditions of fallout, as reported by local monitors.

The federal government agreed to help provinces and local governments to plan their radiological defence systems in keeping with the desire to complement the Nuclear Detonation and Fallout Reporting System of the Army. The federal government agreed to share the cost of bulk purchase, servicing, and repair of the necessary equipment, and to provide technical guidance and standards for training. It also undertook to "train the trainers" at the, then, Civil Defence College at Arnprior, Ontario.

As envisioned, the overall system would be comprised of trained monitors, who take actual radiological intensity readings; radiological defence officers at the local level, who collect and evaluate the data from monitors; radiological advisors, at provincial and sub-provincial centres, who consolidate local reports to provide advice and information at those levels; and scientific advisors, who would be attached to the Premier of each province as senior spokesmen on the hazard to health, agriculture, and fisheries from radioactive fallout.

At the local level, the network was comprised of mobile monitors and stations at selected locations throughout the municipality, each equipped with portable detection meters and with dose-recording instruments to track the exposure of individual monitors to cumulative amounts of radiation. Based on reports from posts and stations, radiological defence staff at municipal headquarters would provide advice and guidance to the local officials who were responsible for public information and emergency operations, and then send situation reports along the network to higher levels.

This is the approach to radiological defence Canada took, at least on paper. In practice, the current status of the radiological defence system is poor: only

Alberta, Manitoba, Quebec, and perhaps Prince Edward Island today have a radiological defence organization worth the name; limited training takes place on an episodic basis; and the operating condition of some of the radiation-measuring devices we have is highly suspect.

What to do? The Task Force has concluded that our radiological defence system must be strengthened by measures largely consonant with the 1961 division of labour once agreed to by the federal and provincial governments.

In regard to the Canada-wide requirement for rapid monitoring, it is recommended that all bases and stations of the Canadian Forces be officially redesignated and readied to serve as fallout reporting elements. Further it is recommended that increased numbers of appropriate aircraft and equipment, some to be drawn from the Forces and some in commercial and private use, be designated and equipped as airborne radiation monitors. Third, it is recommended that the Canada-wide communications links needed to move information on fallout, both to senior federal officials and locally to affected regions, be strengthened sufficiently to cater for the problems associated with electromagnetic pulse.

To meet the requirement for a local-level fallout reporting system to complement the Canada-wide system described above, we recommend that each order of government formally accept the 1961 division of responsibility for wartime radiological defence. We recommend municipal governments designate municipal workers who would undergo training in the techniques of radiation monitoring as a condition of employment. We recommend provincial governments take steps to ensure the distribution of radiation detection equipment within the province on a continuing basis, and to take overall responsibility for the training of first-line radiation monitors. We recommend the federal government continue to share the costs of the provision, maintenance, and repair of radiation detecting and dose reading instruments, including new low-range (0-50 millirad) survey meters with a beta capability; to update and reissue its Guide For RADEF Operations and associated technical manuals; to designate a single point of

contact on radiological defence to foster improved contacts with provincial governments and the governments of other countries; and to take the lead in developing new concepts of operations for mobile monitoring teams to supplement its own airborne and fixed-station radiation monitoring network.

Providing the support of highly-qualified specialists in all aspects of the threat from wartime radiation represents a task best undertaken by the provincial and federal governments acting together. Senior governments need to be in a position where each possesses some in-house expertise on such matters as the means, techniques, and priorities for decontamination; estimation of the effects of radiation on food, crops, fisheries, water supplies, and human health; and the treatment of longer-term somatic and genetic illness that will be produced by post-nuclear war environments. The recruitment and training of the decentralized teams may also assist the senior governments to help "train the trainers" that are going to be needed at the local and sub-provincial levels.

Ways should be sought to bring the cost of reliable radiation detection equipment down to an amount affordable in family budgets. Radiation monitors and pocket dosimeters are now being produced again in large numbers by a number of smaller suppliers, and the federal government should act as a source of good advice for Canadians interested in acquiring or producing such equipment. Periodic testing and the public reporting of results would help individuals to make informed choices from among competing products. We also recommend that tariff duties and federal sales tax be waived for these products.

Lastly, we believe that the federal government should prepare self-help, programmed learning materials on measuring radiological intensity that would enable properly equipped individuals to conduct local surveys in a safe manner. People in private or expedient shelters need not be cut off from all reliable information on ambient radiation, especially where self-help advice and accurate devices have been made available for modest outlays of time and money.

Survival Readiness Phase

In section 2, it was observed that in an unsettled world the ideal civil defence program would exist at a state of no-notice readiness, but that such a course would likely prove unacceptably expensive during any prolonged period of international calm.

In this context the impact of restraint is that some rather costly tasks -- public fallout shelter up-grading, for example -- may have to be deferred. The danger is that these tasks may be deferred until it is literally impossible to complete them, even on a crash basis. Individuals who postpone gathering or stock-piling materials they will need to construct or stock a basement fallout shelter could find that local supplies have been depleted by others who were recently in the same position. Any last minute organized effort to suddenly finalize the public shelter program by up-grading and stocking could have the same predictable result.

Whenever nuclear war appears to be a real possibility, any funding limitations placed on public protection will be quickly lifted. However, this could happen far too late in the day to secure value for the money made available. Time can be more important than money in public protection.

A great deal depends on the perception and willingness of the authorities to state publicly, in the midst of a serious crisis, that on-going efforts at crisis diplomacy could fail; that recourse to nuclear weapons has thereby become more likely; and that passive defence arrangements should accordingly be readied and strengthened on a priority basis.

In part this is a matter of simply recognizing a dangerous situation for what it is. Nevertheless, it is also an inference of potential failure on the part of world statesmen and diplomacy, and anyone actually involved in the situation may find this kind of implicit admission difficult to make until events move inescapably toward that conclusion. In Canada, the responsibility to give authoritative direction at such a time is, inevitably, the Prime Minister's.

Nothing could more effectively multiply our losses from nuclear war than to be taken by surprise. Yet as already stated, no-notice readiness is not a practical option, at least for now, except for the key activities of attack warning, crisis public affairs arrangements and crisis management decisions. There is long mileage yet to be covered before that absolute goal can be seriously considered.

In the next few years, governments in Canada acting together and with the private sector will do well to raise current wartime preparedness to a state consonant with a thirty-day survival readiness phase. Once that level is successfully obtained, future consideration may be given to pursuing higher levels of preparedness, wherein the long-term effort will be to bring the survival readiness phase closer in length to the period of strategic warning.

Tactical Warning System

The requirements for any system of tactical warning are speed, coverage, and intelligibility. As tactical warning is given only upon receipt of signals that an attack on North America is imminent or has actually begun, the requirement for speed is largely self-explanatory. Coverage, however, has more than one aspect. It refers primarily to geography, and our tactical warning system should give Canadians everywhere the same rapid notice. Coverage also extends to the need for penetration, so that the alert is audible whether individuals are indoors, out of doors, asleep, or awake. The requirement for intelligibility arises where the tactical warning system is not based on the spoken word but rather on audible tones or signals. What is required is a distinctive sound, that is, one not too easily confused with others.

For many years Canada, in concert with most nations in Western and Eastern Europe, has relied on a network of outdoor sirens for tactical warning. Over the past few years, the government of the United States has rehabilitated just such an aging siren warning system in cooperation with state and local government. That country is now blanketed by modern attack warning sirens, of which there are 450 in the District of Columbia alone. In contrast, the National Capital Region has 57, 504 must suffice for all other parts of

Ontario, and 282 for all other parts of Quebec. The existing sirens are not all operational. In Newfoundland, perhaps half of the original 71 still work.

Nor do our present sirens satisfy the requirement for speed. Only two provinces, Quebec and Prince Edward Island, can activate all their sirens centrally from the provincial warning centre. In British Columbia, on the other hand, only seven sirens are centrally controlled; 339 (or 98%) depend on a time-consuming telephone fan-out system to relay the message to sound the attack alert. In the other provinces more than half the present sirens are not centrally controlled.

The present siren system also fails to satisfy the requirement of intelligibility. It is suspected that most Canadians cannot now recognize the warning sound for nuclear attack, which is a wailing or undulating tone on the sirens of three to five minutes' duration. Similar signals are sent to warn of the presence of fallout over the local area served.

Warning that is not widely understood is no warning at all. So on our three criteria, speed, coverage, and intelligibility, the aging network of sirens that remains to us does not satisfy the requirements it is supposed to meet.

Within the federal government, consideration is being paid to an alternative means to deal with the shortcomings of the existing siren system. It is called the Crisis Home Alerting Technique (CHAT) and would operate through the television and radio receivers found in virtually all Canadian homes. Essentially these would be tuned to CBC stations and left on whenever a sufficiently serious emergency arose, although stations would send no audible signals from 11:00 p.m. until 7:00 a.m. unless there were need to do so. The CBC network, both radio and television, would be on the air in a technical sense around the clock, standing ready throughout the night to pass attack-related information.

Worthwhile as this seems, it is suggested that it does not rectify all the deficiencies of the siren system. It would not serve to warn people out of doors,

and it presupposes that individuals will not forget to turn their receivers on, to tune them to the CBC, and that they will not simply sleep through the broadcast message.

It is proposed that the need for modernization and expansion of the siren system as the primary means to solve the problem of attack warning be affirmed. New sirens should be installed where they are needed. Every siren should be directly connected to a central switching system in each provincial warning centre, thus eliminating the need for time-consuming telephone fan-out procedures.

As well, authority to sound the sirens when enemy attack has been detected should formally be placed on the senior staff of the Canadian Federal Warning Centre, precluding the need for Prime Ministerial concurrence in the decision to sound them.

The perplexing problem of intelligibility remains. Few better symbols would exist of the decline of public awareness of wartime public protection arrangements than empirical evidence of widespread ignorance of how warning of enemy attack against Canada would be sounded. In the United States, just such evidence has recently been precipitated by the accidental sounding of attack warning sirens in an area not far from Washington, D.C.

In Canada, any similar lack of public awareness could be dealt with as part of a more comprehensive program of war-related public information. At the same time, it is apparent that the evolution of siren technology since the 1960s now affords us the opportunity to develop dual-use sirens, capable of service in both wartime and peacetime emergencies. To play this role, Canada's renewed siren system should be made accessible to provincial and municipal governments in view of the smaller scale of peacetime emergencies. Further, there is some prospect that actual voice signals could be sent out through a modern siren network, a development that would greatly simplify the public information aspects of a dual-purpose system. Each of these promising leads should be pursued, while rectifying the war-related deficiencies which have been described.

Public Information

Some of the low-cost but worthwhile projects proposed tend to shift the burden of action from governments to the individual, the family, the voluntary organization, or the private sector firm.

If the onus is on Canadians generally to play a more active role in seeing to their own protection, it is nevertheless incumbent on their governments to provide the best and most current information to help them succeed. The agenda of public information issues and needs identified throughout this report is very full, and the materials needed to address them must reach a standard of excellence that will foster greater public interest and understanding. Further, any lack of authoritative and contemporary public information materials contributes to the present climate of opinion which consigns the field of wartime public protection to the category of dangerous and expensive delusions.

Everyone should of course fear nuclear war. Its devastating effects need not be grossly exaggerated to make the irrefutable point that nuclear war would be an unprecedented catastrophe that is best kept from happening.

Most Canadians expect that more than this can and should be said, even granting that assessments of complex events that have never happened are basically guesses. The want of any contemporary Canadian statement on the effects of thermonuclear war is keenly felt. No great purpose would be served by some crash effort to write a detailed Canadian appreciation of nuclear war whose credibility would be limited by the borrowed and incomplete information it would have to rely on.

The first recommendation is for a commitment from the federal government to sponsor a continuing program of scholarly research which will provide an objective basis for future public information materials on nuclear war and the passive preparations we might adopt in advance of one.

The second recommendation is for a moratorium on the further distribution of all existing brochures,

booklets, pamphlets, fact sheets, and audio-visual presentations on civil defence pending very careful review. In particular, Planning Guidance in Relation to a Nuclear Attack on North America in the 1980s (EPC 2781) should be quietly withdrawn. No useful purpose is served by the continued circulation of such materials. The government of Canada should distribute widely, once it becomes available, authoritative planning guidance on the civil implications of nuclear war in the 1980s.

Third, as soon as practical and for as long thereafter as it is needed, all orders of government must work to reconstruct a solid foundation of public awareness of the peril of nuclear war, of relevant governmental programs, and of what is left to individuals and families. In making this recommendation we are simply echoing the language of Project Phoenix, a federal study of many of these same issues undertaken sixteen years ago:

Plans and preparations must be made for conveying to the public in peacetime, the necessary information and guidance on emergency measures, and developing a capability to provide information and instructions in a war emergency with a view to reducing casualties and maintaining morale.

Fourth, once progress permits, we believe that descriptions of the main lines of Canada's program in wartime public protection should be incorporated into the curriculum of our public schools. The provinces of Quebec and Alberta have already begun to provide school children with interesting and informative materials on self-help and self-protective measures, and they could perhaps take the lead in extending their innovative work to war-related emergencies.

Pre-Attack

No matter how well the continuing foundation of public awareness has been built, Canadians' perception of crisis indicators will occasion a demand for survival

information that will swamp the limited capacity to respond that we now have. Governments at all levels, together with all common carriers, have a responsibility to meet this predictable demand. If they fail to do so, they will inadvertently scuttle other operational priorities that remain to be tackled. What is needed is the ability to respond quickly to quite foreseeable and probably universal concerns.

There are two facets of this problem: content and carrier. Content means, here, sound guidance in crisis conditions. What this means, in turn, will depend upon the level of wartime public protection we have achieved. Crisis-related public information should be a straightforward reminder of what we Canadians have built and sustained for the possibility of war, nationally, provincially, locally, and at home. It should help us to make optimal use of the remaining pre-attack hours and days to complete and to occupy public and private fallout shelters, and to prepare ourselves, as best we can, for the unthinkable.

The less we have by way of preparation that is and is seen to be of value, the more crisis public information will have to concentrate on expedient protective measures that can be implemented on a crash basis. The life-saving potential of expedient measures should by no means be neglected. The federal government, in particular, could do more to educate Canadians about these less than ideal survival techniques.

About carrier -- or the technical means of disseminating crisis information -- the Task Force has found no easy alternative to rather complex arrangements. The federal government must be able to transmit timely crisis-related information on a Canada-wide basis; municipal governments must be able to communicate information of a highly local nature; and provincial governments will wish to speak to the people of their provinces.

Because Canada is so well served by her print and electronic media, it should be possible to devise and put in place a system to meet these needs. A renewed emergency broadcasting system, the product of a partnership between governments, the CBC/Radio Canada, and private television and radio stations, could see to the coordinated transmission of war-emergency public

information materials at different levels. The technology exists for a first-rate emergency broadcasting system in Canada, and this potential should be actively developed.

Provincial and municipal governments also have a parallel obligation to state plainly their own requirements in the renewal of the emergency broadcasting system.

The print media, too, should play a vital role in war-related public information programs, in keeping with their capacity to reach people with hard copy. Whenever crisis-related information must be retained for ready reference or is especially complicated, newspapers and even magazines represent the best possible carriers. To the extent possible, detailed local instructions and direction should be issued in print and, once again, prior planning and open discussion would permit this to happen when it should -- in the early stages of preparedness.

Post-Attack

Emergency public information in the post-attack environment may sound like one of those topics best left untouched. Since the ravages of electromagnetic pulse have now been described in declassified documents, it is obvious that all the concepts of operations that simply assume the continuation of the means of electronic communication can no longer be relied on. However, most of the fresh technical thinking that is now needed is well beyond the competence of this Task Force.

The effect of EMP is to underscore the highly local character of post-attack operations. Those communications systems that survive EMP, aside from those we successfully strengthen in the coming years, will be few and far between. Where repair and reconstruction are possible, small networks seem much more likely to be restored first. This is as it should be, in view of the very local need for radiological information, for guidance in life-saving operations, for site-specific emergency public information, and for morale-raising communications.

Future work should seek primarily to give precedence to local needs, and reflect a preoccupation with electro-magnetic pulse. Priority should be given to developing two local communications systems that must be shielded or otherwise completely protected against EMP and that could quickly be set up and made operational.

The first communications system should at minimum allow for point-to-point communications along a few dedicated frequencies for a range of ten to twelve miles. The purpose of this system is to permit radiological and other kinds of information to begin to flow as soon after attack as is possible.

The second communications system should be capable of broadcasting information, again at least for a range of ten to twelve miles. The purpose of this system is to share information, provide guidance, and be a source of comfort.

Neither system should rely on external sources of power. Neither should be technically complex or difficult to repair or to keep running. And neither should be very expensive, to judge by the pace of progress in the age of micro-electronics and high technology.

The first system could possibly be built around the kind of battery-powered electronics that are being developed for pleasure boating applications. These are self-contained, high-frequency units that send and receive ordinary voice messages. A municipal government could use these units to link radiation monitors with any central station, to maintain links with police forces and fire departments, and conceivably to maintain communications with very large public fallout shelters.

The local broadcasting system should be capable of transmitting information to the widest possible audience within the restricted limits of its power. In practice, this means an A.M. radio signal, but the general radio service (C.B. radio) may also be a possibility and should be considered. Highly portable, self-powered transmitters with, perhaps, fifty watts of power would probably suffice over the short term.

Here, too, we have some resources, at least potentially. Something approaching 95 percent of all

Canadians are routinely within range of one of the 550 A.M. radio stations that serve every part of our country. These local stations may represent the best asset we have in restoring local area public information services in the post-attack environment. It is also possible that we could strengthen at least one A.M. station in each community so that it could withstand, or not be made completely unusable by, electro-magnetic pulse.

The stations, repeaters, and affiliates of the CBC/Radio Canada are a national asset with considerable local importance. The eighty A.M. stations in question reach about ninety percent of all Canadian households.

As a federal agency, the CBC/Radio Canada represents a means and a symbol of national cohesion. The restoration of its capability to serve as a trans-Canada network in the aftermath of nuclear war should be regarded as an important step in maintaining the political integrity of the country. Governments should recognize what a vital resource the radio network is, and give priority to strengthening the capacity of all CBC/Radio Canada radio transmitters to withstand electro-magnetic pulse. In the aftermath of nuclear war, in communities with more than one A.M. radio station, the restoration of the CBC/Radio Canada station or affiliate should come first. Eventually, sufficient numbers of these local 'building blocks' could again make possible the diffusion of information simultaneously to survivors across Canada.

Essential Services

The goal of enhancing the wartime emergency preparedness of municipal¹ and other local organizations performing essential services appears some years away, even given hard work and much thought. Local preparations that would help to soften the destruction nuclear war would wreak on Canada's social fabric can, however, be developed more rapidly where a solid base of achievement in peacetime emergency planning exists.

¹If more appropriate, our remarks on local or municipal government should be read as referring to the governments of urban regions, where they exist.

To underscore the significance of the municipal role in wartime the Task Force recommends that the provincial governments identify this role in legislation. Where they are needed and can be responsibly exercised, special wartime powers and temporary authorities for municipal government -- together with safeguards against abuse -- should be established in a manner and form of provincial choice. Such special powers might enable municipalities to maintain public order, to appropriate local supplies of essential goods and equipment, and to conduct survival and life-saving operations in wartime circumstances.

In war-related emergencies, municipal government also has the inescapable duty of consolidating and utilizing local public sector assets, resources, and expertise. This refers to those found not only in municipal departments but also in hospital and school boards, local health and social welfare agencies, police and fire departments, municipal transit systems, and water and power authorities. No other elected government will be in a position effectively to array these local assets against local problems. Special wartime powers for selected municipal governments should make clear their lead role and authority here.

Provincial governments, while constitutionally responsible for municipal government, would in fact be highly dependent on local governments in wartime, particularly in the post-attack period. Provinces must act on the implications of this fact by mounting programs that local politicians would find of material help as they in turn become active in a field that little in life may have prepared them for.

If a local government is fairly to be expected to exercise special wartime powers and authorities, it must be helped to do so in advance of the need. Provincial governments must assure that every designated municipal government is provided with assistance in carrying out the preparedness-building tasks before it. Where they do not now exist, a single point of contact should be identified in these local governments to stimulate municipal emergency preparedness for both wartime and peacetime contingencies, and to act as a liaison with allied agents in other governments on a continuing basis.

Depending upon the size and wealth of the municipality, this point of contact could take the form of an operating division of local government, a small group, or a single official. Whatever form they take, the municipal emergency officials must be, and be seen to be, competent and knowledgable. Their development as professionals should be made a major element in the future training activities of the provincial and federal governments. The quality of local area preparedness will depend greatly on the quality of the local area instruction to be conducted subsequently by these officials.

This single point of contact must not take the form of a quasi-military group of full-time specialists who care about nothing else but the threat of nuclear war. Such groups tend to become easy targets for elimination during periods of budgetary restraint at City Hall.

Rather, emergency preparedness, both peacetime and war-related, should become an integral part of the on-going responsibilities of municipal and other local line managers having otherwise varying principal duties. It is only through them, and with their active cooperation, that local emergency staff will materially affect the standard of local preparedness. The successful melding of the emergency planner's expertise and the line manager's familiarity with local conditions and prospects requires the former to serve as a repository of experience, knowledge, and sage advice for the latter. That is why emergency staff must seek, above all, to be of real use to real politicians and to real managers who themselves may have limited time and few resources to devote to emergency planning, whether for peacetime contingencies or for war.

In case of wartime emergency preparedness at the local level, progress is going to take time, and will require the complicity of many line managers who are not now persuaded that their efforts could make any real difference in the aftermath of thermonuclear war. Nor can their abiding support be legislated or ordered. To be certain, the special wartime roles of municipal departments and allied local agencies need to be set out with some care and precision. But thereafter line managers must be left to manage, with special help available locally if it is needed. Detailed concepts of operations that may bear no resemblance to local

abilities or prospects should never again be imposed blithely, and thereafter referred to as responsibilities.

In concert with progress at the local level, provincial governments should attend to their own special wartime roles. High among these should be the public designation, in cooperation with their municipalities and the federal government, of all private sector firms and corporations which in wartime would become subject to governmental control and direction. At the local level, for example, this might include wholesale grocers and food distributors; vendors of fuel oil, propane, diesel fuel, and gasoline; suppliers of pharmaceuticals, medical supplies and equipment; local or provincial telephone companies; wholesale and retail outlets for seed grain, animal feed and agricultural machinery; local firms with equipment and expertise in construction and engineering; and all outlets for certain special products like firearms and ammunition, alcohol, and tobacco. Together with the print and electronic media, these private sector entities have important roles to play in building emergency preparedness in Canada at the local level, and if they are to play these roles well they should be closely involved in the planning that is essential for subsequent effectiveness.

Emergency Operations

At a certain remove, all emergency operations are broadly similar. Where provided for by law or, in extremis, according to the demands of the situation, the exceptional authority vested temporarily in a coordinating official must quickly and visibly be assumed and exercised as part of a planned crisis management system. The dimensions of the immediate crisis must be rapidly assessed, including any requirement for special equipment, personnel, or other resources. A communications system must be made and kept operational to satisfy the need for an orderly flow of information up, down, and across the network of involved agencies. A plan of action that expressly caters for operating limitations imposed by the emergency itself is required as soon as possible to assure coordination among the various actors -- some governmental, some not -- having a role to play in the operation. Some provision must be made for the

gathering of feedback and other information that would permit later evaluation of the operation or, if needed, to demonstrate that adjustments of priorities may be required as the crisis wears on or changes character. In round-the-clock or protracted operations, considerable thought must be devoted to shifts, stages, and delegations of authority. These are all elements of the process of local crisis management, a process that is an essential precondition of effective emergency response. Because it will not somehow "just happen", the coordination and management of emergency operations must themselves be planned in advance and well understood by all involved. Much the same considerations also apply to the management of provincial and federal emergency operations.

Wartime circumstances will change none of this; they make it more difficult to do. Perhaps some casual examples may help to illustrate the kinds of problems wartime emergency planners must try to anticipate.

In the case of emergency welfare services, some consideration must be given to the possibility that Canadian currency may be essentially without value in the aftermath of nuclear war. This implies that the direct provision of essential services like feeding and sheltering may be necessary, as against offering payment to others to perform them.

In the case of law enforcement, there will never be enough police officers to carry out the expanded number of tasks wartime circumstances will create. This implies need for auxiliary and special officers to attend to some of these tasks, among them perhaps traffic control, the maintenance of order in and around public shelters, the enforcement of special powers of appropriation, or the guarding of vital points and processes.

In the case of emergency health care, the wartime conditions we have to anticipate will be austere and demanding, requiring the application of medical techniques developed especially for them. Our medical resources may well prove inadequate, but they need not be employed inefficiently. In order to achieve the maximum benefit from surviving medical resources, government has a responsibility to reach out to medical

practitioners, their professional associations, and to para-medicals to seek their guidance and support in developing new concepts and arrangements for austere mass casualty care, for more appropriate training, and for the optimal contents and uses of emergency medical stockpiles in a post-attack setting.

The same type of government-to-expert dialogue should occur wherever enhanced emergency preparedness -- for war, surely, but also for natural disasters and major industrial accidents -- requires some melding of different talents and resources. Our public utilities, telecommunications systems, and many purely private sector endeavours of vital significance can likely be strengthened or made less vulnerable by the timely action of skilled personnel. Small steps of this kind can sometimes produce substantial benefits, and this is why governments should foster a more cooperative approach to emergency preparedness in open partnership with professionals, industry, and the voluntary sector.

Most Canadians harbour some appreciation of the dreadful reality that must be considered in different ways by different people seeking to limit injury, suffering, and destruction in the wake of nuclear war. No one can derive much satisfaction or comfort from this form of contingency planning, but no one should dispute its continuing importance and legitimacy while the threat remains.

Remedial Evacuation

There is almost no organized capacity anywhere in Canada to find and remove survivors from dangerous local environments in a post-attack period.

Remedial evacuation shares with radiological defence, rescue, and decontamination operations one characteristic we would like to address here. They can be conducted only by individuals who are willing to take the risk that they may be exposed to high rates of radiation in the field. It would be easy to conclude that our present lack of preparedness in these areas results from the unwillingness of individuals to undergo this risk on behalf of others. There may be some truth in this, but we suspect that there is not a great deal.

In the aftermath of nuclear war, no one who is unwilling to go is going to be ordered into high-risk areas, at least not successfully. No one should be ordered or even asked to enter areas where the extent of the danger has not been accurately established, within the limits of what is then possible.

Individuals will, however, accept a known risk in view of some higher purpose. People do it every day. And people would do it also on behalf of others in the aftermath of nuclear war, provided that the balance of probabilities seemed right to them. The amount of good they could do would probably more than offset the amount of harm that would be done to them in the process.

It is better to have a few well-trained but cautious personnel in radiological defence, rescue, remedial evacuation, and decontamination operations than legions of exceptionally brave but untrained volunteers. Accordingly, we recommend that the provinces resume their training role in these post-strike operations, with federal support and assistance. We also recommend that other training having peacetime application -- in the techniques of light rescue or in first aid, to take two examples -- be made more widely accessible to members of the general public. Our goal should be the development of a nucleus of highly-skilled individuals in every province who are fully aware of both the rewards and the risks of life-saving and survival operations in a post-attack setting.

There is another aspect of remedial evacuation which is not unrelated, although it does not involve physical danger. This is the reception aspect, meaning that local communities be a place of succor and comfort to those injured or made homeless by nuclear weapons on at least a short-term basis.

It is necessary to distinguish between the reception function in this context, and the reception function as it might arise in crisis relocation or dispersal. The refugees or evacuees having the stronger claim on a community's heart are those who have suffered through direct attack or its immediate effects. They could be completely dependent upon others for the provision of health care and the other essentials of

life, even given real effort on their part to see to their own welfare beforehand.

Emergency planners in every local community should anticipate the need to provide at least a minimum standard of reception service in peacetime and in war. Whether for those who have been successfully evacuated on a remedial basis or for those who have somehow reached town, every undamaged community in particular should be prepared to respond on an emergency basis to the needs of the homeless, ill, and injured who reach it in the post-attack period or in the aftermath of any other disaster.

It is unlikely that every local community will be able to reach the standard in reception community preparedness set out in A Guide to Civil Emergency Planning for Municipalities. Local efforts to strengthen the essential services should reflect serious attention to meeting the foreseeable short-term needs of arriving families and individuals. A new approach is needed for the more taxing requirement of longer-term reception on a mass basis.

Sustaining Survival

This report differs from earlier discussions of civil defence in its treatments of time and space. The Task Force does not believe that the devastation nuclear war would wreak would permit very many Canadian survivors to entertain thoughts of recovery as early as two or three weeks after the event. Nor do we assume that large parts of the country will not suffer real harm, even if initially unaffected by direct damage or local fallout.

It is more likely that the secondary and tertiary effects of nuclear war, when aggregated on a global basis, may considerably extend the length of time most, if not all, Canadian survivors could be unable to engage in productive work -- anything beyond salvage and scavenging in ruins -- to restore depleted stocks of food and other essentials. Delayed fallout from multiple detonations of nuclear weapons could contaminate much of the Northern hemisphere, while significant modifications to the climate and the atmosphere may make it impossible to raise crops for a year or two, at least by normal methods.

None of the classical civil defence concepts of operations from the 1950s and 1960s offers any guidance on the practical implications of theoretical research undertaken in the 1980s. In addressing the apparent need for some institutional means to sustain survival for what could be a protracted period, a very radical departure from past approaches is proposed. In sum, if reception is understood as the ability to meet fundamental human needs on an emergency basis, every Canadian survivor could have need of reception before the possibility of recovery materializes anywhere in this country.

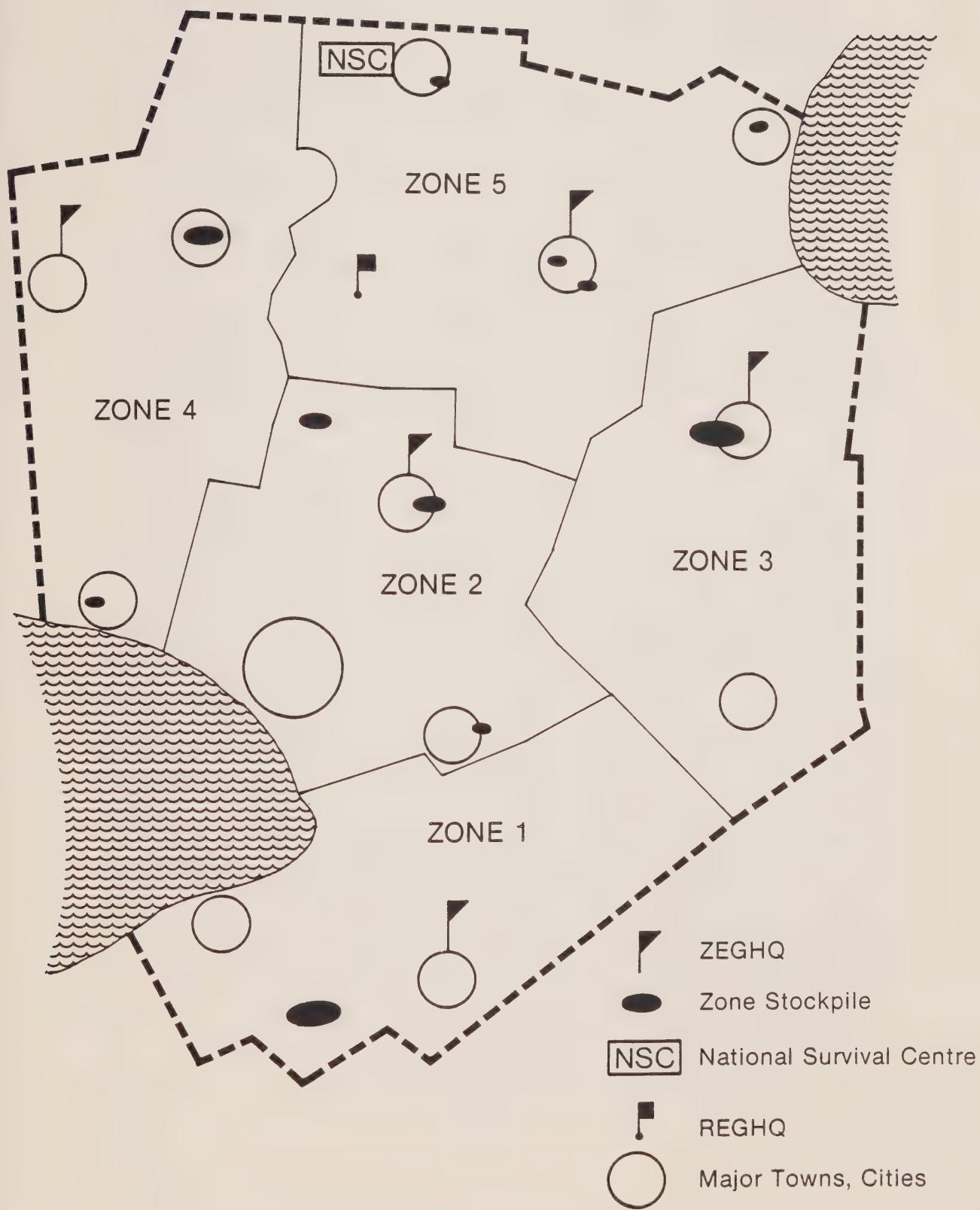
The Zone Concept

Traditional Canadian civil defence concepts of operations did anticipate the need for a means of coordinating post-attack operation on a scale larger than the municipality but smaller than the province. In 1961, even before provincial and federal departments were vigorously decentralizing government services away from the capitals, and even before most of the governments of large urban regions had been established, some 65 civil defence zones were designated across Canada. These zones were sub-provincial areas formed of aggregations of municipalities, counties, townships, or census divisions. They were seen as the smallest practical areas in which federal and provincial authority could be exercised to coordinate post-attack operations, in part by resolving conflicts among competing local priorities. To this end, zone emergency government headquarters were established in perhaps thirty-five locations across Canada. Some of these structures remain in usable condition, and still provide a site for provincial and federal officials coordinating peacetime emergency operations.

The Task Force supports the zone concept and would like to see it renewed and expanded, as follows.

First, public protection or civil defence zones of operations must be formally identified or redesignated, as the case may be, by the provincial governments, with the support and encouragement of affected municipalities and the federal government. Figure 2 illustrates that a hypothetical province might be divided into five zones.

Figure 2 — Zone Operations



Second, during the survival phase, each zone would be governed by federal and provincial elements working together from a protected site within the zone in a city deemed relatively safe from attack. As in the traditional model, these joint administrations would initially coordinate local life-saving operations during the early stages of the survival phase. Thereafter, zone administrations would concentrate on sustaining survival for zone residents. This role would have to be underpinned by special wartime authority, permitting zone authorities to appropriate and redistribute the remaining quantities of essential goods and supplies not already part of household or family stockpiles within a zone territory. These special powers would be designed to mesh with those conferred on municipal governments in order to facilitate joint operations. In Figure 2, it is intended that zone emergency government headquarters are shown in medium-sized cities, away from the major metropolitan centre vulnerable to direct attack.

Third, the medium-sized cities in which zone headquarters are situated should themselves be reinforced and strengthened to provide reception services for zone residents for a six-month period. That is, in each zone one community should be readied to meet the elemental needs of dispersed, displaced, or evacuated survivors. These needs are for warm, safe, and livable hostels; for ample and nutritious food; for skilled medical attention and care; and for allied social service, including security and law enforcement.

Fourth, each zone administration should develop, control, and manage a zone stockpile -- a kind of survival warehouse for zone residents. Figure 2 shows that these could be single or multiple, and that they could be located near zone government headquarters or at some distance from them. What is essential is that they, together with other surviving resources within the zone, add up to enough food, blankets and clothing, fuel and heating oil, radiation detection meters, pharmaceuticals and medical equipment, portable generators, communications gear and transportation equipment to make possible the provision of reception services on a large scale for six months.

Thus, the zone concept advocated maintains continuity with past practice through its role in

coordinating life-saving operations. But it also represents a break with tradition by establishing a focal point in the struggle to sustain survival for the first six months following nuclear war. The purpose of this longer-term role is to nurture survival locally, to the extent possible, without resort to inter-zonal or inter-regional transfers of people or goods.

So conceived, reception over time on a zone scale is not a municipal responsibility but a federal and provincial one. To be sure, it would depend upon a baseline state of preparedness that has to exist in at least one community in every zone.

As a spur to the development of this baseline preparedness, two or three representative medium-sized cities could very profitably be used as laboratories in the next year or two by the federal and provincial governments. Together, and in cooperation with the municipal governments of these cities, the senior governments should seek to stimulate the development of the municipal and local capabilities called for in this report. We refer to the deeper work and field trials in public and private fallout shelters along the lines already described; the reconstruction of an effective local radiological defence system; the enhancement of local capabilities in, at least, law enforcement and emergency health and welfare services among the essential services; together with a mixture of efforts to make electronic communications and local broadcasting less vulnerable to electro-magnetic pulse. Just such baseline achievements are needed before a zone role in short-term coordination or longer-term reception can be played or even planned for effectively.

If they do not exist, zone headquarters structures should be constructed in these communities, perhaps by the modification of federal or provincial buildings that already provide adequate fallout protection. The establishment of these emergency government operating centres and the installation of emergency communications equipment within them could also bring lasting benefits for peacetime emergency preparedness. Where federal and provincial officials must work cooperatively to cope with the effects of natural disasters or major accidents, they should be co-located in decentralized emergency operating centres of the type needed in every zone in wartime. The zone concept, more generally, is

another war-related idea that could be brought to life in a manner that serves peacetime preparedness. The Task Force recommends innovative development of the zone concept to foster intergovernmental cooperation and dual-use application.

The Cost Issue

This kind of experimental field work in two or three communities could also help to meet the need for more reliable budgetary information than we now have. The zone concept and the achievement of adequate wartime public protection in Canada are going to cost more than we are now spending on civil defence -- even if the lower-cost alternatives are pursued.

The Task Force has not, however, been able to estimate the total costs of the implementation of its own recommendations, for the simple reason that we have no actual or hard data on expenditures to use for the necessary calculations. To develop this information, the cost of bringing a few communities to a baseline standard of preparedness should be carefully tracked and analyzed. Where there are alternative approaches to satisfying a wartime requirement -- in fallout shelters, for one example -- we think they should be tried, to permit subsequent benefit-cost evaluations. In all such experiments, it is important to remember that some quite costly crisis preparations can be deferred until strategic warning signals have been received. In periods of increasing tension, sufficient funds will be available to complete these preparations.

National Survival Centres

The special functions proposed for zones, zone headquarters, and reinforced communities, their place as seats of wartime federal and provincial administration, their emergency stockpiles, and the advanced preparedness capabilities described will, if implemented, do much to lessen our very great current vulnerability to predictable post-attack shortages of the essentials of life. The de-concentration and dispersal to familiar local settings of the goods, supplies, experts, services, and types of equipment necessary to sustain survival across the country will guarantee at least the

possibility that life here can be preserved in the face of very unfavourable conditions for quite a lengthy time.

Renewal of the zone concept may be a necessary condition of success in sustaining survival; it is certainly something that must be in place by the time it is needed. Decentralized zone stockpiles and specially reinforced communities may not, however, prove to be a sufficient condition to sustain survival, particularly if nuclear war causes very great damage to the global environment.

To cater for this express possibility, the federal government should create a network of twelve to fifteen "National Survival Centres" having the primary role of warehousing emergency stockpiles of food and other survival resources, and the means of transporting these considerable distances. These centers should be situated in remote and relatively safe parts of Canada, although, as Figure 2 suggests, at least one should exist in each of our provinces. They would serve no other purpose than to assist in the fight for longer-term survival, should the dispersed resources to be made available at the zone level prove insufficient in this regard.

The Task Force has no desire to launch a purely theoretical debate about the optimal form of National Survival Centres. They might in any case take somewhat different forms in different regions in order to reflect the possible variations across Canada in post-attack conditions and prospects. Their contents as well as their location, form, and role could very usefully be a subject of early consideration by governments.

Only by pooling our collective resources in zones and National Survival Centres, or any functional equivalents, can some of the more common horror stories about life in the aftermath of nuclear war be made to appear less persuasive than many Canadians now find them. In the present climate of opinion a failure to answer the question of how we might in fact succeed in preserving life for a protracted period in highly unfavourable conditions would prove fatal to the general case for wartime public protection.

During any grave international crisis, the federal government must be in a position to give public assurances that sufficient food has been placed in protected locations to meet the needs of survivors for a period of at least one year. Were it not to develop such a capability, the federal government would deeply prejudice its ability, and that of other governments, to generate much support for the other program elements that make up the field of passive defence. If the federal government does take the lead in this way, other governments would find it much easier to argue for survival measures of more immediate focus and use.

In the post-attack setting, governments that actually control valuable resources to sustain survival would be in a stronger position to guide and foster recovery, once that does appear a reasonable next step.

SECTION 4

TOWARD RECOVERY

The first steps on the tortuous path toward recovery may be said to have taken place when we start to use what remains to us for purposes not of consumption, but of production. If it is true, as seems likely, that many cities and perhaps some provinces will have suffered neither direct nor indirect damage, a foundation on which to sustain recovery could be available.

Whether, with careful husbanding of the raw resources, the human talent, and the finished goods we shall then have to work with, at the local, zone, provincial, and national scales finally will prove sufficient is a most difficult question. The answer will be affected by several gross and hard-to-measure factors, among them the extent and kind of damage nuclear weapons have caused in Canada and globally, the remaining technical capacity we have to bring about inter- and intra-regional transfers of people and goods, and perhaps most importantly our continued desire to work together as Canadians.

The overall strategy survivors would set for themselves and seek to carry out, once short-term survival seemed reasonably assured, would emphasize self-sufficiency. The objective would be to reforge the strong links required by a human community large and diverse enough to generate self-sustaining momentum toward recovery. Each survivor should not have to learn to farm in the morning, perform delicate surgery in the afternoon, and stand on guard all night, as some survival literature implies. Rather, survivors should find it possible to apply their talents and abilities to part of what should be a collective endeavor. Here government could play an essential part in the process.

Continuity of Government

Many Canadians are aware of the main lines of the continuity of government program, and the existence of a network of "Emergency Government Headquarters" for key governmental decision makers was never much of a secret. The public was informed that these arrangements served two purposes: to preserve the thread of constitutional

authority in Canada by protecting those in whom it is vested and, secondly, to provide a site from which survival operations could be directed by federal and provincial ministers.

The continuity of government program has attracted a good deal of criticism and ridicule. It is sometimes portrayed as another instance of government looking after its own in a fashion far better than it looks after the rest of us. The fact is that the continuity of government program is not in good shape today, and that those it is intended to protect may be in greater danger than the rest of us anyway.

The first basic concept that underpins the continuity of government program is still valid: namely, that the survival of legal and constitutional authority in the aftermath of nuclear war should be a high national priority. Nothing could better symbolize the determination of Canadians to endure and to recover than the living example of the Crown in Canada and those we have freely chosen to govern in its name. Nor could anything so deeply subvert our fixity of purpose than the unnecessary loss of those on whom its authority is conferred, both federally and provincially.

Even assuming that these EGHQ's would not be directly attacked, there is doubt at this time whether those inside would be able to take an active part in directing survival or recovery operations -- the second basic concept underpinning the program -- at least while they were there. Although, on paper, this role is still accorded the central and regional (provincial) emergency government headquarters, sufficient attention has not been paid to these facilities for many years by the federal and provincial ministers for whom they exist.

In theory, federal and provincial ministers, together with key public servants and others, could be dispersed to suitably prepared and protected sites, provided with some of the means and instruments of modern government, and perform an authoritative and valuable function in the aftermath of nuclear war. In practice, however, the emergency government facilities are not in good mechanical condition, their communications equipment is badly out of date, few essential records and files are stored there, no capacity in

electronic data processing exists in any of them, and they stand every chance of being isolated from the public by electro-magnetic pulse.

The continued allegiance Canadians will be willing to pay to their government in the post-attack environment will depend, in large measure, on the performance and usefulness of government itself.

Although both of the basic concepts that underlie the continuity of government program remain valid, the program itself should be significantly changed, as follows.

First, the legal foundation of the continuity of government program should be confirmed in constitutional law. To preserve the thread of legal authority both federally and provincially, we must establish whose survival is essential in law. We need to know, as well, whether the special legal status of these high offices can be assumed by succession, delegated, or transferred during a crisis by reason of the death or incapacity of incumbents. It may also be desirable to review the statutes that have been passed to confer exceptional powers on federal and provincial executives during emergencies. Neither the War Measures Act nor provincial emergencies legislation seem quite appropriate for governance immediately before, during, and in the aftermath of nuclear war. We shall return to this subject presently, as the question turns on the roles Canadians wish their governments to play in any future wartime circumstances.

Depending upon the answer to the legal issues just mentioned, and as action of a second sort, the physical arrangements and means to assure the survival of essential persons must be chosen and put in place. Where the survival of any single living person has been demonstrated to be required, the choice of means ultimately rests with that person. In law, nothing could be gained by pretending otherwise or by constructing facilities that will not be used by the very individuals they must protect.

Where lines of succession are legally clear, or where quick resort to delegates or alternates is authorized by statute, the choice of means to assure survival could be made from among several alternatives.

More specifically, the normal operating centres of executive government could be strengthened against blast and/or fallout; the existing emergency government facilities near federal and provincial capitals could be rehabilitated; alternative or duplicated executives could be sworn in and dispersed to protected or very remote locations; or new legislation might be passed to decentralize the extraordinary constitutional authority of the federal government to deal with national emergencies from Ottawa to senior officials located in regional, provincial, or zone emergency governmental headquarters. It is, indeed, entirely possible that different means or mixtures of means may be felt appropriate in different jurisdictions. It is, however, not now apparent what limitations the constitution may place on the emergency transfer of authorities among federal, provincial, and municipal governments -- as could be needed for zone operations of certain kinds.

Third, the continuity of government programs must have local expression. Arguments have previously been made for special wartime powers, and safeguards, for selected municipal governments, and have called for their taking charge of coordinating and fostering wartime preparedness at the local level. The revitalized zone concept also seeks to decentralize federal and provincial government as much as possible. These roles presuppose and require that municipal and zone officials have access to facilities that would permit them to keep working even under conditions of radioactive fallout and without normal telecommunications. No more than three or four such sites now exist among our twenty largest cities, and very few zone headquarters have been maintained over the years. Accordingly, the federal and provincial governments should assume an equitable share of the costs of the construction and upgrading of emergency operating centres for zones and for any municipalities having expanded wartime roles.

Fourth, the continuity of government program must also satisfy the second basic concept it is meant to serve: bringing governmental authority and direction to the collective effort to sustain survival and nurture recovery. Federal and provincial governance immediately before and after nuclear attack will require special

legal powers and authorities to meet the extremes wartime circumstances will bring with them. Any individuals on whom such authorities devolve must have access to protected facilities, or to facilities remote from danger, to stand any chance of being able to play desired and desirable roles in the aftermath of nuclear war.

Indeed, all special emergency facilities of government generally must be prepared very carefully if they are to serve well in post-attack conditions. In addition to fallout protection, secure and reliable telecommunications equipment strengthened against or made less vulnerable to electro-magnetic pulse, is an obvious headquarters requirement. Where a public information role is envisaged, emergency broadcasting transmitters similarly shielded from EMP will be necessary. To assure the presence of skilled and specialized headquarters personnel who will be needed to bring some semblance of order to post-attack operations, a high continuing state of readiness must be achieved in appropriate forms of organizational planning. This implies the further requirement that each individual having an important operational role should be familiar with and trained to perform the duties assigned to him or her. In turn, this implies that all such individuals fully understand and freely accept these duties, and are committed to discharging them whenever required.

Headquarters effectiveness, finally, presupposes an established plan of action that intelligently consolidates governmental and societal assets and arrays them skillfully against pressing needs. This holds for governance at every scale. In our federal system, increasing the war-related preparedness of government as such during the rest of the 1980s will entail the close cooperation of federal and provincial officials to set shared objectives, to identify the roles of each order of government in securing them, and to develop the face-to-face communications on which operational effectiveness will subsequently depend.

In relation to survival in the first few weeks following attack, the agenda before government is fallout shelters, radiological defence, warning systems, public information, the essential services, remedial evacuation, and reception. In relation to longer-term

survival, re-invigoration of the zone concept and the establishment of National Survival Centres is recommended.

The Role of Government

What could Canadians fairly expect governments to do for them in the aftermath of thermonuclear war? Beyond survival, governments would fairly be judged by reference to what assets they will be able to bring to the goal of recovery.

These assets should take several different forms. First, government should be capable of contributing whatever material resources remain from the zone and National Survival Centre stockpiles that should be created for the purpose of sustaining survival and fostering recovery. There is no better measure of the value of this contribution than the amount of essential supplies -- food, pharmaceuticals, medical instruments, radiation meters, seed grain, fuel oil, gasoline, communications equipment, and other materials certain to be in short supply -- that government actually has on hand.

Second, governments could contribute specialized knowledge. Few Canadians now have expertise in detecting and measuring ambient radiation or in treating radiation sickness, in assessing the lasting impact various intensities of fallout would have on livestock, arable land, food supplies, and our fisheries, or in determining what kinds of crops might do best in an unusually hot (or cold) environment, or one marked by high amounts of ultra-violet light. We might expect, then, that most of those who are to be protected would have expertise of these kinds to share with other survivors when they emerge from their shelters.

Third, governments could bring timely information to our survival efforts. Survivors will need quite local information on residual contamination; the availability of food, water, and medical care; and the whereabouts of friends or family members. They will wish to have information on the extent of the damage in their communities, provinces, across Canada, and in other countries. They will wish to know what productive capacities are left to them, and whether any apparent environmental damage is transient or lasting, is limited

to Canada, to the Northern hemisphere, or is global. Survivors may find it helpful to learn something of the world political and military situation, and whether Canada or any other country remains at war.

Fourth, Canadians might expect that government could bring legal authority and direction to the effort to nurture recovery. In constitutional theory, we live in a country where the Crown does not derive its authority from the willing consent of the governed, but in the post-war environment such consent would be everything and ought not be presumed to be present. The rule of law could be preserved or reestablished more easily if surviving elements of the federal and provincial governments demonstrate not just the intention but also capability to guide recovery, to preserve public order, and to prevent political fragmentation in the aftermath of nuclear war. There are purely internal steps our senior government can, and should, take to raise their standard of preparedness in this regard.

Federal and provincial governments should negotiate a clearer, more precise, and mutually satisfactory model of the "National Emergency Agency" than is currently set out in the Emergency Planning Order (P.C. 1981-1305).

There exists plenary constitutional authority possessed by Parliament to legislate for the "peace order, and good government of Canada" to respond to national emergencies, and to war in particular. In our system, there is simply no doubt that the range of controls Parliament may lawfully establish for wartime circumstances could be practically limitless. The very breadth of the War Measures Act illustrates the scale of control Parliament once felt necessary to confer on the central executive to face a less threatening emergency than that under consideration in this report.

As important as it sometimes appears, increased federal constitutional authority to govern in a national emergency is not the key to the question of recovery in the aftermath of contemporary thermonuclear war. For one thing, there can be no guarantees that the ministers, officials, and machinery of government needed in or around Ottawa and the provincial capitals will survive to try to exercise authority on the scales

needed to implement wide-ranging controls. For another, large-scale governance requires accurate and timely information as well as the capacity to communicate and enforce decisions, none of which could reasonably be presumed to exist nationally or even provincially in the aftermath of nuclear war. For a third thing, it would be prudent to anticipate quite powerful local tendencies toward anarchy, and to anticipate that government -- like survival itself -- could very quickly become a highly local matter, in fact if not in law.

If public order does break down in this country, it will not be because Canadians are naturally unruly, but because they are cold, hungry, injured, angry, confused, or simply too close to those who are. We can speculate that the rule of law could be one of the first casualties of nuclear war, although all such ruminations are less constrained by knowledge than by imagination. From the perspective of the governments, however, the preservation of the constitutional order and the rapid re-establishment of the rule of law are of paramount importance. However, committing to paper theoretical plans for the central control of national resources may not bring the federal government closer to its objectives in the circumstances now being considered.

The re-establishment of effective Canada-wide government in the aftermath of nuclear war will take time and much else besides; the same could be said of province-wide government, especially where devastation has been severe. Public order and the rule of law would probably be rebuilt from the local level, in concert with governmental operations that meet the elemental needs of Canadian survivors, not imposed by fiat from distant provincial and federal enclaves.

To serve in the survival period, therefore, the resource-control machinery of both federal and provincial government should be decentralized as much as possible, preferably to the level of sub-provincial zones. It is there that the remaining resources will be found, and it is from there that they will most efficiently be matched with pressing needs by genuinely national emergency agencies. It is initially at the zone level that special federal powers permitting the

appropriation and control of national resources would appear to have most meaning and value.

In the weeks and months following attack, there will probably be surplus resources of some kinds in some parts of Canada, and there will be need for them in other parts of Canada. But it will take time to ascertain this, and it will take thought to determine the optimal and most equitable redistribution of these resources. Much will hinge on the availability of the technical means of transfer. Indeed, one of the considerations that will arise very early is whether large groups of survivors might not best themselves be evacuated and resettled in less-damaged areas, where their prospects to participate in the recovery appear better.

Only the federal government, acting with the full cooperation of the provincial governments and over time, could succeed in establishing sufficient authority and legitimacy to make such decisions in respect of Canada as a whole; to consider and to adjudicate competing regional and local priorities for repair, reconstruction, and new production; and to secure equity in the Canada-wide distribution and redistribution of scarce resources required to sustain survival and foster recovery. The federal government should plan for their role in concert with others.

Where our common purposes are as basic as survival, our governments should legally be vested with the power of appropriation over whatever can be deemed essential. Most Canadians are already prepared to accept this to enhance their own prospects for survival and recovery. To go much beyond these preliminary observations, however, is to court the danger of misplaced specificity. The federal and provincial governments should devise an acceptable division of labour between them, having regard equally to jurisdiction and to what will work.

The imperative for truly national emergency arrangements is simply that nothing else will work in post-attack conditions.

Ideally, we should speak not of federal, nor provincial, but of national plans and arrangements for

the control and management of our surviving resources in the post-attack period.

In contemplating the requisites of recovery a further need must be satisfied: to bring the people of Canada into the partnership essential in fostering recovery. In the final analysis it is the people who matter most in all this, and nothing will substitute for their active participation in Canada's survival strategy either now, when the subject can seem academic, or later, when it will not.

The Longer Term

If, as Carl Sagan's data suggest and Jonathan Schell's Fate of the Earth concludes, a nuclear war waged in earnest would entail the extinction of the human species, the subjects discussed heretofore in this report have at best only academic meaning. None of them, not adequate shelter, not radiological defence, not emergency stockpiles for recovery would make the slightest difference in a world where human life everywhere is being inexorably extinguished.

Sagan, Schell, and others who promote the hypothesis that nuclear war cannot be survived may or may not be correct. We are only slowly developing the analytic capability to estimate the ecological and longer-term implications of nuclear war, and we are very far from having conclusive data to show that the inherent recuperative powers of nature, vast as these may be, might not simply and irrevocably be overwhelmed. We are, all of us, entirely justified in fearing nuclear war and in hoping that one day some conjunction of doctrines, circumstances, and personalities will rid us of this spectre.

The history of the nuclear age that is already available to us provides the lesson that this day may be very long in coming. Indeed, there are many who counsel that we are still moving in the wrong direction, at once caught in and reinforcing a dynamic that is bound to terminate in catastrophe.

These counsels are perhaps too easily given. The nearly four decades that have passed since Hiroshima and Nagasaki have not been uncommonly peaceful, but do

disclose that it has proven possible so far to avoid thermonuclear war.

Many, perhaps most, Canadians are persuaded that just as nuclear war cannot be "won", nuclear war cannot be survived. They do not need complicated computer simulations to tell them why this is the case, and may not wish to be told that it is not the case.

There is in fact no computer simulation that proves that survival and recovery are impossible. Nor, in the nature of things, are we ever likely to know whether they will not be possible, unless and until the horror of nuclear war actually occurs, thus putting the question in dead earnest. We simply do not know what truth there may be in the "doomsday" scenarios that are put forward from time to time by experts and amateurs alike.

We do know that models and simulations ultimately reflect the assumptions and estimates programmed into them. Many have been criticized for neglecting factors and forces that could prove of decisive importance in influencing the capacity of the damaged natural environment to cleanse itself even of major pollutants and irritants.

But perhaps the team of scientists who wrote "Nuclear Winter: Global Consequences of Multiple Nuclear Explosions" (Science, December 23, 1983, page 1283) should speak for themselves:

Our estimates of the physical and chemical impacts of nuclear war are necessarily uncertain because we have one dimensional models, because the data base is incomplete, and because the subject is not amenable to experimental investigation. We are also unable to forecast the detailed nature of the changes in atmosphere dynamics and meteorology implied in our nuclear war scenarios, or the effect of such changes on the maintenance or dispersal of the initiating dust

and smoke clouds. Nevertheless, the magnitudes of the first-order effects are so large, and the implications so serious, that we hope the scientific issues raised here will be vigorously and critically examined.

This is why we have had no hesitation whatever of recommending that serious work in this field be made a Canadian priority.

SECTION 5

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

SECTION 1 - INTRODUCTION

The Basic Question

Under current and foreseeable conditions, any conceivable nuclear war would leave some Canadian survivors.

Sources of Uncertainty

There is no generally accepted model of what form nuclear war would take and no consensus exists on the specifically Canadian implications of such a war. The probable extent of devastation is unknown.

Canada has a number of locations that could represent second-or third-order priorities for a nuclear attack.

Public protection is not a field that can be consigned neatly to Ottawa or to provincial capitals. Rather, it requires building and sustaining a partnership among federal, provincial and municipal governments, not to mention industry, voluntary organizations and individuals.

Is "Civil Defence" Possible?

Civil defence cannot guarantee survival.

"Civil defence" means an organized effort to limit death and injury and to marshal available resources in an attempt to soften the destruction nuclear war would cause.

The Purpose of the Report

To identify means to increase the number of Canadians who would survive nuclear war and materially improve the chances of reconstituting society.

SECTION 2 - WARTIME PUBLIC PROTECTION: AN OVERVIEW

This section presents a preliminary analysis of the components of wartime public protection in Canada. It identifies the seven elements that would form the heart of a program of civil defence for the 1980's and beyond.

They are:

- Shelter Planning
- Radiological Defence
- Warning and Survival Readiness
- Public Information
- Essential Services
- Remedial Evacuation
- Reception

Shelter Planning

The feasibility of a network of shelters has been, and is still, the heart of the question of civil defence. There remain only three ways that a threatened population can organize this: blast shelters, fallout shelters and expedient shelters.

Blast Shelters

Because of the uncertainties associated with targeting, direct weapons effects and weapon sizes, blast protection is a questionable use of scarce resources.

Fallout Shelters

Residents of every province could be subject to life-threatening levels of fallout.

It is possible, as a matter of basic policy, to provide adequate fallout protection for every Canadian.

Expedient Shelters

Quite substantial levels of protection can be provided by employing simple construction techniques using commonly available materials.

Expedient shelters may prove superior because they do not presuppose complicated government planning or extensive private investment.

At the very least, it will be several years before the measures proposed in this report can be implemented.

Individuals and families should be encouraged to develop their own shelter arrangements.

Detailed Arrangements

Successful implementation requires attention to detail such as: identification, allocation, stocking, organization, ventilation, sanitation and livability.

Crisis Relocation

Crisis relocation on the American model is not well-suited to Canadian conditions. There are better ways to utilize the limited resources available.

Canadians desiring to disperse voluntarily should be provided with reliable guidance, sufficiently detailed to allow them to improvise effective shelter and maintain a measure of self-sufficiency.

Radiological Defence

It is a matter of very highest importance to have in place a dependable means of determining where fallout is present and where it is not. Radiological defence can deceptively appear to be a relatively simple and straightforward matter. A large part of the problem could be sheer lack of knowledge.

Formidable technical barriers to post-attack communications of any kind may preclude the rapid transmission of fallout information. Most of the instruments we have to rely on to measure radiation are not now present in our local communities and may not be in good operating condition.

Having, and maintaining in readiness, a network of trained radiation monitors with reliable equipment has proven and still is the most challenging part of the problem. Two distinct networks are required; one to determine the general situation Canada-wide and a second to identify local safe and unsafe areas.

The deceptively simple problem of radiological defence at the local level has not been solved.

The impact of EMP on communications must be taken into account.

Warning and Survival Readiness

Warnings are predictive assessments of the time remaining before an attack. The Survival Readiness Phase is that period of time during which the national state of civil preparedness for war would be raised from its peacetime levels to a state of total readiness. This phase would be initiated as a reaction to deteriorations in international relations.

For planning purposes, a nominal period of thirty days is considered appropriate for the Survival Readiness Phase. It should not be interpreted as an expectation or prediction, but rather the levels of preparedness for war that ought to be developed and sustained even in time of peace.

There are three key activities that must be maintained in a high state of readiness. These are: the attack warning system, crisis public affairs arrangements, and crisis management systems.

It is postulated that a period of 7 to 14 days of Strategic Warning could be expected wherein conditions had further deteriorated to the point where an attack on North America appeared highly probable. The period of strategic warning therefore covers the tail end of a continuously deteriorating crisis. Increased priority for public protection preparedness would be initiated at the beginning of the Readiness Phase.

An effective tactical or public warning system will advise Canadians that an attack is imminent or has begun, allowing them to reach prepared shelter.

Public Information

An effective program of public information is a precondition if governments are to be of material value to the people of Canada both before and after a nuclear attack.

There is a low level of public awareness of the promise of life-saving countermeasures. The best time to inform people about what can be done to survive is before the need to do so becomes necessary. The time is now. The precious hours of what could be the pre-attack period should be given over to ensuring the livability, not the existence, of shelters.

There is a need for an emergency broadcast system that can be activated to furnish information on self-help measures early in the Readiness Phase. The print media can perform a valuable service in delivering public guidance now and in the Readiness Phase.

There is now an appreciation of the effects of the electromagnetic pulse (EMP) that accompanies every nuclear detonation. Simply stated, it can devastate all unprotected electronic aids to command, control and communications. The entire civil telecommunication system is extremely vulnerable to EMP. There are no assurances that essential information can be communicated, nor is the general public aware of the threat of EMP. To be of material value to Canadian survivors, governments must be capable of responding to quite elementary information needs.

Essential Services

Essential services includes emergency social services, police, fire-fighting, rescue, transportation, medical care, food, housing, public utilities and other services that have to be conducted in the aftermath of nuclear war.

There is nothing automatic about the process whereby resource will be intelligently applied to problems. Planning is essential.

The most immediate dangers facing survivors will be acute shortages of food, potable water, shelter and medical care.

A contemporary arrangement should be developed and maintained, in full consultation with the medical services community, for austere medical care of mass casualties, training and medical stockpiles.

All major cities, while being regarded as possible targets, are also potential strongholds for survival, but this preparedness has to be achieved in peacetime.

It is necessary to recognize that survival very quickly becomes a highly local matter, deeply dependent on capabilities that must be in place when needed.

Remedial Evacuation

This activity stems from the possibility that parts of Canada may have been rendered incapable of sustaining life and individuals within them must be relocated if they are to survive. It is a foreseeable requirement if we are to minimize casualties.

Reception

Reception is the capability to receive and care for refugees and evacuees and is an essential component of our passive defence arrangements. As a generalization, few Canadian cities have devoted more than passing attention to this requirement.

In Sum

Each of the individual activities described is very much worth doing but none is worth doing in isolation.

No single order of government can solve these problems on its own: a cohesive partnership is needed.

SECTION 3 - A CLOSER LOOK

Current Concepts

Judged from the mid-1980's, surviving concepts of operations suffer from three problems:

- Time alone has taken its toll on concepts developed in the 1960's.
- They understate the consequences in light of more recent information about the effects of

of electromagnetic pulse and longer-term atmospheric and ecological effects.

- They presuppose capabilities in wartime government that will not likely exist.

The Task Force concluded that traditional civil defence approaches that assume that the period between attack and recovery will be short requires re-definition. Following the Readiness Phase and Strategic Warning, a Survival Phase would begin, when Canadians are directed to adopt fallout-protected shelter. Should an attack occur, fallout predictions and warnings would be issued, damage assessed and life-saving operations conducted. It could be several months or longer before productive work could resume.

Shelter Planning

Fallout shelter is the key component of civil defence for Canada. A mixed strategy advocates four parts: a public shelter program, a program for private residences, a program to assist dispersal where preferred, and a program in research and public information. The period that some Canadians will occupy fallout shelters may exceed the two-week period adopted in 1960's concepts.

The Public Shelter Program: It is recommended that:

- the minimum universal protection factor be not lower than 50;
- the federal government select a representative sample of shelters and modify them in order to deepen our knowledge about raising protection factors;
- federal and provincial governments cooperate in conducting trials on shelter equipment and stocking;
- individuals who come to share public shelter be asked to solve the problems of shelter management together;
- the federal government produce new shelter management materials for non-specialists;
- legal barriers to public use of congregate shelter space in private buildings be struck down in law;

- property owners be induced to maintain shelter space through capital cost offsets;
- community shelter plans be completed now, before the Readiness Phase begins; and
- a reliable communications system be prepared so that those in public shelters can be advised of the radiological conditions outside.

A Program For Private Residences: It is recommended that:

- the federal government give considerations to a matching grant program to help offset the costs to homeowners seeing to their own protection;
- provincial and municipal governments support and assist the program by managing and delivering such a grant program and by rebating sales taxes on shelter materials and foregoing property tax increases;
- Canadians be encouraged to equip their homes to provide a measure of self-sufficiency;
- the federal government continue to make detailed guidance on home preparations widely available.

A Program to Assist Dispersal recognizes that many Canadians will prefer to relocate from some of our larger cities and that spontaneous dispersal cannot be wisely overlooked. Anticipating and channeling dispersal should be integral components of any approach to shelters. For this program it is recommended that:

- the federal government conduct research into the scope of potential dispersal that Canadians may prefer;
- Canadians intending to evacuate their areas of residence in advance of actual attack be formally put on notice that no special arrangements to receive them have been made anywhere in Canada;
- financial support be extended for preparing fallout shelters, in a relocated residence, in lieu of assistance for preparations in the principal residence;
- once empirical evidence is available on potential dispersal in Canada, all orders of government should plan for the stresses and strains it could cause.

A Shelter Research and Information Program to produce information about Canadian conditions rather than use off-shore data. It is recommended that:

- federal and provincial governments jointly create a program of assistance to those qualified, for research into all forms of shelters; and
- sophisticated, high quality and accurate publications on shelter be prepared and given the widest public diffusion.

Radiological Defence

While the Task Force could describe the characteristics of an ideal radiological defence information system, the technology and resources to put it into place do not exist. The Task Force therefore recommends that:

- research and development on the technical foundation for an ideal radiological defence system continue.

The Task Force concluded that our current system must be strengthened by measures largely consonant with the 1961 division of labour agreed to by federal and provincial governments. Within this arrangement it is recommended that for the Canadian-wide requirement:

- all bases and stations of the Canadian Forces be officially re-designated and readied to serve as reporting elements;
- increased numbers of appropriate aircraft and equipment, to be drawn from the Forces, commercial and private use, be designated and equipped as airborne radiation monitors; and
- Canada-wide communication links be strengthened against EMP.

For the local system, we recommend that:

- each order of government formally accept the 1961 division of responsibility for radiological defence;
- municipal governments designate municipal workers who would undergo training as a condition of employment;
- provincial governments take steps to ensure distribution of equipment within the province on a continuing basis;
- provinces take overall responsibility for training first-line monitors;
- the federal government:
 - continue to share the cost of provision, maintenance and repair of equipment,
 - develop a low range survey meter with a beta capability,
 - update and reissue the Guide for RADEF Operations and associated technical manuals,
 - designate a single point of contact on radiological defence to foster improved contacts with provinces and governments of other countries, and
 - take the lead in developing new concepts for mobile monitoring teams;
- federal and provincial governments act together to provide highly qualified specialists in all aspects of wartime radiation;
- ways be sought to bring the cost of radiation detection equipment down to an amount affordable in family budgets;
- tariff duties and federal sales tax be waived on radiation detection equipment; and
- the federal government prepare self-help programmed learning materials on radiation monitoring that would enable individuals to conduct local surveys safely.

Survival Readiness Phase

A great deal of effective use of the time this phase will provide will depend on the willingness of authorities to state publicly that recourse to nuclear weapons has become more likely, in the midst of a crisis, and that passive defence arrangements should accordingly be readied and strengthened on a priority basis.

In the next few years governments and the private sector, acting together, will do well to raise preparedness to a state consonant with a thirty-day readiness phase. Thereafter, consideration may be given to pursuing higher levels of preparedness.

Tactical Warning System

The requirements for any tactical system for public warning are speed, coverage and intelligibility. Our current system of sirens does not satisfy any of these requirements. Canadians would likely not recognize the warning sound for nuclear attack. The Crisis Home Alerting Technique (CHAT) does not rectify the deficiencies of the siren system.

The Task Force recommends a modernized and expanded siren system as the primary means to solve the attack warning problem, within which:

- new sirens are installed to provide necessary coverage;
- each siren is connected to a central switching system in each province;
- authority to sound the sirens is formally placed with the staff of the Canadian Federal Warning Centre;
- public awareness of the siren system is addressed in war-related public information;
- the prospect of future voice signals over a modern siren system is examined; and
- consideration be given to making the system accessible to provincial and municipal governments for peacetime emergencies.

Public Information

It is incumbent on governments to provide the best and most current information if Canadians are to play a more active role in their own protection. Lack of authoritative and contemporary public information materials contributes to the present climate of negative opinion about public protection. In order to address

the needs of a revitalized program and the requirement of greater public understanding of passive defence capabilities, the report recommends that:

- federal government sponsor a continuing program of scholarly research that will provide an objective basis for future public information materials on nuclear war;
- a moratorium be placed on further distribution of all existing brochures, booklets, pamphlets, fact sheets and audio-visual presentations on civil defence, pending careful review;
- the Planning Guidance in Relation to a Nuclear Attack on North America in the 1980's, (EPC 21/81) be withdrawn;
- the federal government distribute widely, once it is available, authoritative guidance on the civil implications of nuclear war in the 1980's;
- all orders of government work together to reconstruct a solid foundation of public awareness of the peril of nuclear war, relative government programs, and what is left to individuals and families; and
- the description of the main lines of Canada's program for public protection be incorporated into the curriculum of our public schools.

In the pre-attack period, public perception of crisis indicators will occasion a demand for survival information that will swamp our limited capacity to deliver. Governments and carriers have a responsibility to put into place arrangements to respond quickly to quite foreseeable and probably universal concerns. The Task Force recommends, for pre-attack arrangements, that:

- crisis information should help to make optimal use of the remaining pre-attack hours and days;
- the information should include life-saving expedient measures;
- governments, the CBC/Radio Canada and private television and radio stations cooperate to establish a renewed emergency broadcasting system to provide a coordinated transmission system for public information materials from all levels;
- provinces and municipalities state plainly their requirements in a renewed system; and

- detailed instructions that must be distributed and retained in the Readiness Phase should be prepared, through cooperation between governments and the print media, for rapid production and distribution.

In the post-attack period, the net effect of EMP will be to underscore the highly local character of post-attack operations. Small networks seem more apt to be restored first. For the post- attack period public information needs, the Task Force recommends that:

- priority be given to developing two local stand-alone communication systems that are completely protected against EMP in order to;
 - permit radiological and operational information to flow in point-to-point communications, and
 - broadcast radiological information and guidance;
- all CBC/Radio Canada radio transmitters be strengthened to withstand electro-magnetic pulse.

Essential Services

Local preparation can develop more rapidly where a solid base of achievement in peacetime planning exists. Municipal governments have the inescapable duty of consolidating all local assets. Provincial governments will be highly dependent on local governments in the post-attack period. The quality of local preparedness will depend greatly on the capability of designated local emergency officials. In order to enhance the preparedness of local emergency services the Task Force recommends that:

- provincial governments identify the significant role of municipalities in wartime, in legislation;
- provinces mount programs that local politicians would find of material help as they become more active in wartime preparations;
- local governments identify a single point of contact to stimulate municipal preparedness;
- emergency preparedness be an integral part of the on-going responsibilities of municipal and local line managers;

- future concepts of operations bear resemblance to local abilities;
- provincial governments, in cooperation with municipal and federal governments, designate all private sector firms and corporations which in wartime would become subject to governmental control, and closely involve them in planning.

Emergency Operations

Competence in management of emergency operations is a pre-condition to effective local, provincial and federal response. The Task Force recommends that:

- all orders of government put into place essential crisis management plans, and ensure that crisis management arrangements are well understood.

In some cases emergency circumstances will outstrip the resources of some emergency services. Therefore auxiliaries should be considered.

The Task Force recommends that:

- the Canadian medical services community be brought into discussions in developing new concepts and arrangements for austere mass casualty care, training and emergency medical stockpiles applicable to the post-attack setting; and
- governments foster a more cooperative approach to emergency preparedness in open partnership with professionals, industry and the voluntary sector.

Remedial Evacuation

It is better to have a few well-trained personnel in radiological defence, rescue, remedial evacuation and decontamination than legions of brave but untrained volunteers. Trained personnel will be able to determine when benefits can exceed risks in a post-attack environment.

The report recommends that:

- provinces resume their training role in post-strike operations, with federal assistance and support;
- community plans anticipate the need to provide reception in peacetime and in war;
- local plans concentrate on the foreseeable short-term needs of evacuees; and
- a new approach be developed for longer-term reception requirements on a mass basis.

Sustaining Survival

This report differs from early Canadian material about civil defence in its treatment of time and of space. The secondary and tertiary effects of nuclear war may considerably extend the length of time before which most, if not all, Canadian survivors could be able to engage in productive work. The report approaches the matter of sustaining survival through an expanded and more independent Zone concept, and with consideration of zone and national/regional stockpiles required to sustain sub-provincial areas for extended periods.

The Zone Concept is recommended for renewal and expansion, as follows:

- provinces formally identify or re-designate zones of operation;
- each zone be governed by a designated federal and provincial team working from a protected site;
- special wartime authority for zone officials be identified;
- zone headquarters be constructed if they do not exist;
- medium-sized cities in which zone headquarters are located be reinforced to provide reception services for the zone for a six month period;
- each zone have an additional stockpile of resources to make possible the provision of reception services on a large scale for six months, thereby placing reception responsibility over extended time on provincial and federal governments;

- where federal and provincial officials must work cooperatively to cope with the effects of peacetime emergencies, they be co-located in decentralized operations centres of the type needed in zones in wartime; and
- in order to develop the concept, two or three medium-sized cities be used as laboratories, in which all arrangements are brought to a baseline preparedness.

The Cost Issue

The Task Force had no data on which to calculate the cost of an expanded zone concept. The cost of bringing a few communities to a baseline standard of preparedness should be carefully tracked and analyzed.

National Survival Centres

While a renewed and expanded zone concept may be a condition of success in sustaining survival, it may not prove to be sufficient if nuclear war causes very great damage to the global environment. Failure to answer the question on how we might succeed in preserving life for a protracted period in highly unfavourable conditions would prove fatal to the general case for wartime public protection.

The Task Force recommends that:

- the federal government create a network of National Survival Centres having the primary role of warehousing emergency stockpiles of food and other survival resources, and a means of transporting these considerable distances; and
- their contents, location and form be a subject of early consideration between governments.

SECTION 4 - TOWARD RECOVERY

Recovery may be said to have taken place when we start to use what remains to us for the purpose not of consumption, but of production. The objective in recovery is to reforge the links required to generate self-sustaining momentum. Governments will ensure their essential part in guiding this collective endeavour by providing for continuity of essential government, by the contribution of assets to recovery and by developing truly national arrangements for resource control.

Continuity of Government

The basic concepts of the continuity of government program remain valid. Survival of legal and constitutional authority able to take an active part in directing survival and recovery should remain a high national priority. However the program itself should be significantly changed.

The Task Force recommends that:

- the legal foundation of the continuity of government program be confirmed in constitutional law, establishing those offices whose survival is essential and the means available to ensure continuity of those offices;
- the physical arrangements required to ensure survival of essential persons be chosen and put in place;
- where lines of succession are permitted, the choice of means to assure survival must be made from a number of choices, recognizing that the option selected may vary in different jurisdictions;
- federal and provincial governments assume an equitable share of the costs of constructing and upgrading emergency centres for zones and for municipalities having expanded wartime roles;
- emergency facilities be carefully prepared, their operating procedures developed and designated participants trained; and
- federal and provincial governments identify shared objectives and their respective roles in securing them.

In relation to survival in the first few weeks following attack, the recommended agenda will be fallout shelters, radiological defence, public information and warning, essential services, remedial evacuation and reception. In relation to longer-term survival, re-invigoration of the zone concept and establishment of National Survival Centres is recommended.

Role of Government

Beyond survival, governments would be fairly judged by the assets they can contribute to recovery. To the degree that communications permit, these assets can take the form of material resources from zones and national stocks, specialized knowledge, timely information, and legal authority and direction to nurture recovery by controlling the allocation of resources. Theoretical provincial and federal plans for centralized resource control may not bring either closer to their objectives for re-establishing province or nation-wide government. The Task Force recommends that in order to prepare for adequate contribution of these critical assets that:

- federal and provincial governments negotiate a clearer, more precise, and mutually satisfactory model of the "National Emergency Agencies" than is currently set out in the Emergency Planning Order (PC 1981-1305);
- resource control machinery of both orders of government be decentralized to sub-provincial zones; and
- the people of Canada be brought into the partnership essential in planning for and fostering recovery.

The Longer Term

The Task Force recommends that:

- serious scientific work in Canada continue, to examine and reduce the uncertainties about the estimates of the impact of nuclear war.

ANNEXES

TASK FORCE ON WAR PLANNING AND CONCEPTS OF OPERATIONS

AIM

It will be the aim of the Task Force to study war planning in relation to protection of the public and the operational concepts for implementing such planning; and to make appropriate recommendations including the required draft operational concepts to a plenary meeting of federal/provincial senior officials.

TERMS OF REFERENCE

1. Review, in the light of current international and Canadian war planning assumptions, the following aspects of public protection in Canada
 - shelter planning
 - radiological defence
 - public information
 - warning
 - essential services
 - continuity of government
 - remedial evacuation and reception
2. Consult federal and provincial experts, as may be desirable.
3. Review existing concepts of operations in each of the above areas, and confirm or recommend modifications to them; or develop new concepts as necessary.
4. Make recommendations aimed at ensuring that the planning and concepts of operations will be compatible, consistent and effective.

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5. "Attack Warning Siren System"
6. "National Emergency Agencies - Planning and Organization"
7. "Economic Planning, Resource Control and Transportation"
8. "Continuity of Government and Essential Services"
9. "Public Information"

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